Audit Report

OFFICE OF THE INSPECTOR GENERAL

ADVANCED MATERIALS RESEARCH, DEVELOPMENT, TEST AND EVALUATION LABORATORIES WITHIN DOD

Report No. 94-075

April 1, 1994

Department of Defense

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Acronyms

AMTL	Army Materials Technology Laboratory
ARL	Army Research Laboratory
BRAC	Base Realignment and Closure
DA	Department of the Army
DMRD	Defense Management Review Decision
DDR&E	Director, Defense Research and Engineering
FYDP	Future Years Defense Plan
GAO	General Accounting Office
IG	Inspector General
JDL	Joint Directors of Laboratories
MILCON	Military Construction (Appropriation)
NSWC	Naval Surface Warfare Center
R&D	Research and Development
RDT&E	Research, Development, Test and Evaluation

INSPECTOR GENERAL
DEPARTMENT OF DEFENSE
400 ARMY NAVY DRIVE
ARLINGTON, VIRGINIA 22202-2884

April 1, 1994

MEMORANDUM FOR COMPTROLLER OF THE DEPARTMENT OF DEFENSE
DIRECTOR, DEFENSE RESEARCH AND ENGINEERING
ASSISTANT SECRETARY OF THE NAVY (FINANCIAL MANAGEMENT)
ASSISTANT SECRETARY OF THE AIR FORCE (FINANCIAL MANAGEMENT AND COMPTROLLER)
AUDITOR GENERAL, DEPARTMENT OF THE ARMY

SUBJECT: Audit Report on Advanced Materials Research, Development, Test, and Evaluation Laboratories Within DoD (Report No. 94-075)

We are providing this final report for your information and use. Comments to the draft report were considered in preparing this final report and are included in Part IV, Management Comments.

Because a contract award for a new Advanced Materials Laboratory at Aberdeen Proving Grounds is being suspended pending resolution of our recommendations, we request the Director, Defense Research and Engineering to reconsider her position on Recommendation 1 and provide comments within 15 days.

The courtesies extended to the audit staff are appreciated. If you have any questions on the audit, please contact Mr. Raymond Spencer, Program Director, at (703) 614-3995 (DSN 224-3995) or Mr. David Vincent, Project Manager, at (703) 693-0355 (DSN 223-0355). Appendix J lists the planned distribution of this report.

Robert J. Lieberman
Assistant Inspector General
for Auditing

Enclosure

Office of the Inspector General, DoD

Report No. 94-075 **April 1, 1994**
(Project No. 3AB-0058.01)

REPORT ON ADVANCED MATERIALS RESEARCH, DEVELOPMENT, TEST AND EVALUATION LABORATORIES WITHIN DOD

EXECUTIVE SUMMARY

Introduction. The mission of DoD laboratories is to maintain technological superiority over potential adversaries. The laboratories also provide technical expertise to the Military Departments so they will be smart buyers and users of new and improved weapons systems and support capabilities. The total DoD funding for Research, Development, Test, and Evaluation (RDT&E) laboratories in FY 1991 was $13.8 billion. In May 1993, we began a self-initiated audit, "Advanced Materials and Electronic Devices Research Laboratories Within DoD" (Project 3AB-0058).

Objectives. The overall audit objective is to determine whether redundant investment is being made by DoD in Advanced Materials and Electronic Devices Research and Development Laboratories. Specific objectives include evaluating the adequacy of DoD management and oversight of the various laboratories and the effectiveness of Project Reliance as implemented by the Joint Directors of Laboratories. We are also evaluating laboratory consolidations and realignments to verify cost avoidance claimed by Project Reliance in response to Defense Management Review Decision 922 initiatives.

Audit Results. In the survey phase of the audit, we identified plans by the Army and the Navy to build major new laboratory facilities and to procure new equipment for advanced materials research that may be unnecessary and redundant to existing DoD capability.

Internal Controls. The audit identified material internal control weaknesses. Internal controls were not effective to ensure DoD review of the Army and Navy's laboratory restructuring proposals. Details of the internal control weaknesses are discussed in Part I and in the discussion of the finding in Part II.

Potential Benefits of Audit. We estimated that the DoD could save a significant portion of $160 million currently planned for new building construction and equipment by utilizing existing Air Force laboratory space and equipment. Appendix H. summarizes potential benefits of this report.

Summary of Recommendations. We recommended that the Comptroller of the Department of Defense withhold the military construction funds for the identified projects until an independent and objective analysis has been completed that reevaluates the proposed new laboratories. We recommended that the Under Secretary of Defense for Acquisition and Technology task the Defense Science Board to study the need for those new facilities from an overall DoD perspective.

Management Comments. Comments have been received from DDR&E, the DoD Comptroller, and the Army, Navy, and Air Force. DDR&E nonconcurred because they felt that further study of the issue was not justified based on advice that BRAC 91 requires the moves to the designated locations. The DoD Comptroller stated that a temporary withhold had been placed on MILCON funds and suggested that BRAC 95 would provide an appropriate opportunity to restudy the issues. The Army nonconcurred stating that the report was factually inaccurate, badly flawed in logic, and the conclusions were legally objectionable. The Navy nonconcurred stating that the Navy has demonstrated a need for the planned materials facilities as part of the 91 and 93 BRAC process. The Air Force agreed that an independent assessment by a group of outside technical experts would be valuable.

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This report was prepared by the Acquisition Management Directorate, Office of the Assistant Inspector General for Auditing, Department of Defense.

Part I - Introduction

Background

The mission of DoD laboratories is to maintain technological superiority over potential adversaries. These laboratories also provide technical expertise to the Military Departments to educate them as buyers and users of new and improved weapons systems and support capabilities. The Army currently operates 21 laboratories, centers, and institutes that employ approximately 29,000 military and civilian personnel. Estimated total Army funding for those laboratories in FY 1993 was $4.0 billion. Policy and oversight for the Army's laboratory system is provided by the Deputy Assistant Secretary of the Army for Research and Technology. In October 1992, the Army Research Laboratory (ARL) was established from the Army Laboratory Command and elements of the Army Research Institute; Belvoir Research and Development Center, Center for Night Vision and Electro-Optics; Tank-Automotive Command; Aviation Systems Command; Chemical Research, Development and Engineering Center; and the Army Institute for Research in Management Information, Communications, and Computer Sciences.

Because of the condition of its facilities and infrastructure, the 1988 Base Realignment and Closure (BRAC) Commission recommended that the Army Materials Technology Laboratory in Watertown, Massachusetts, be permanently closed. A major consideration for this conclusion was the need for major renovation or replacement of laboratory facilities. To avoid the cost of construction, the 1988 BRAC Commission recommended relocating the laboratory. Specifically, to utilize existing Army property, reduce base operations costs, and combine research groups with those working on similar technologies, the 1988 BRAC Commission recommended that the functions and personnel of the Army Materials Technology Laboratory be split among the Detroit Arsenal, Michigan; Picatinny Arsenal, New Jersey; and Fort Belvoir, Virginia.

Based upon an appeal by the Army via the DoD, the 1991 BRAC Commission subsequently modified the 1988 BRAC Commission recommendations and realigned the Materials Technology Laboratory to Aberdeen Proving Ground, Maryland, and approved establishment of the Combat Material Research Laboratory (subsequently renamed the ARL in October 1992) at Adelphi, Maryland. As a result of this 1991 BRAC decision, the ARL plans to build a new Advanced Materials Laboratory at Aberdeen Proving Ground to cost $109 million; a new Microelectronics Laboratory at Adelphi to cost $169 million. In addition the Army plans to build a new Fuze Evaluation Facility at Redstone Arsenal, Alabama, to cost $3 million.

The realignment of the Materials Technology Laboratory will involve relocating approximately 181 scientific and engineering employees, according to the Army, from the existing facility in Watertown to the proposed new laboratory at Aberdeen Proving Ground. The new advanced materials laboratory plans to employ a total of 221 persons, of which 189 would be scientists and engineers. Current plans call for the ARL to be located at two major sites, Adelphi and

Aberdeen Proving Ground. ARL also plans to have several adjunct locations at White Sands Missile Range, New Mexico; the National Aeronautics and Space Administration, Langley Research Center in Hampton, Virginia; and the National Aeronautics and Space Administration, Lewis Research Center in Cleveland, Ohio. Total implementation cost for the ARL including new laboratory construction and personnel-related costs were estimated to be $415 million in the Army's FY 1994 "Justification Submitted to Congress," March 1993.

During FY 1991, the Navy operated 26 laboratories, centers, and institutes that employed approximately 41,700 military and civilian personnel. Navy funding for these laboratories in FY 1992 was $10.5 billion. Policy and oversight for the Navy science and technology laboratories is provided by the Chief of Naval Research, while the five research and development centers report to the Naval Systems Command supported by that respective research and development center. The 1991 BRAC Commission decision to close the Navy's Annapolis, Maryland, laboratories, required the Naval Surface Warfare Center (NSWC), Carderock Division, to realign several materials facilities from Annapolis to Carderock, Maryland. (Carderock is approximately 50 miles from Annapolis.) This realignment will transfer 185 Navy employees to Carderock from Annapolis and has created plans for two Navy military construction projects for new materials research and development (R&D) laboratories at the Carderock location, estimated to cost $37.6 million.

Meanwhile, the Air Force Materials Directorate at Wright Laboratory has significant underutilized laboratory space that the Army and Navy might use in lieu of building new laboratories.

Accordingly, we believe there is a compelling need for an analysis from a DoD perspective regarding the use of existing DoD facilities. We are, therefore, recommending that military construction funds for these Army and Navy BRAC Commission construction projects be withheld pending an objective and comprehensive study to justify the need for the projects.

On May 3, 1988, the Secretary of Defense chartered the BRAC Commission to recommend military installations for realignment and closure. The Commission recommended 59 realignments and 86 base closures using cost estimates provided by the Military Departments. Subsequently, Public Law 100-526, "Defense Authorization Amendments and Base Closure and Realignment Act," October 24, 1988, was passed by Congress and signed by the President to enact the Commission's recommendations. Public Law 100-526 also established the DoD Base Closure Account to fund any necessary facility renovation or MILCON projects related to the realignments and closures.

Section 2902 of Public Law 101-510, "Defense Base Closure and Realignment Act of 1990," November 5, 1990, re-established the Commission and chartered it to meet during calendar years 1991, 1993, and 1995. To ensure that the process for realigning and closing military installations was timely and independent, Public Law 101-510, Section 2904, stipulated that realignment and

closure actions must be completed within 6 years after the President transmits the recommendations to Congress. The 1991 Commission recommended that an additional 34 bases be closed and 48 bases be realigned.

Section 2822 of Public Law 102-190, "National Defense Authorization Act for Fiscal Years 1992 and 1993," December 5, 1991, as amended by the National Defense Authorization Act for Fiscal Year 1993, Section 2825, Revision of Requirements Relating to Budget Data on Base Closures (Public Law 102-190, sec. 2822, December 5, 1991, 105 Stat. 1546, as amended by Public Law 102-484, sec. 2825, October 23, 1992, 106 Stat. 2609; 10 U.S.C. 2687 note), requires that the Secretary of Defense ensure that the authorization amount DoD requests for military construction relating to the closure or realignment of each military installation in each of the fiscal years 1992 through 1999 not exceed the original estimated cost (adjusted as appropriate for inflation) that was provided to the Commission.

The Secretary of Defense may submit a request for authorization that exceeds the estimated cost submitted to the Commission, if he determines the greater amount is necessary. However, if he does, a complete explanation of the reasons for the increase must accompany the request to the Congress.

The law requires the Inspector General (IG), DoD, to investigate each military construction project the Secretary is required to explain, if (under standards prescribed by the IG) the IG, DoD, considers the cost differences to be significant. The IG, DoD, is required to determine why the amount requested to be authorized in the case of that project exceeds the estimated cost of the project that was submitted to the Commission by the Department of Defense, and determine the relevant information submitted to the Commission with respect to whether that project was inaccurate, incomplete, or misleading in any material respect.

Separate submissions were provided by DoD and the Army to the 1991 BRAC Commission regarding the LAB 21 Study (Army Research Laboratory). Specifically, the DoD submission stipulated an estimated cost of $92 million. The separate Army submission stipulated an estimated cost of $348 million. The 1991 BRAC Commission in its report recognized a cost of $281.8 million through FY 1997 for implementing the ARL. Subsequently, in March 1993 the Army requested $415 million beginning in FY 1994 for ARL military construction costs.

Objectives

Our overall audit objective is to determine whether redundant investment is being made by DoD in advanced materials and electronic devices research and development (R&D) laboratories. Specific objectives include evaluating the adequacy of DoD management and oversight of those laboratories and the effectiveness of Project Reliance as implemented by the Joint Directors of Laboratories. We are also evaluating laboratory consolidations and

realignments to verify cost avoidance claimed by Project Reliance in response to Defense Management Review Decision (DMRD) 922 initiatives.

Scope

This economy and efficiency audit is being conducted in accordance with standards issued by the Comptroller General of the United States as implemented by the IG, DoD, and accordingly included such tests of internal controls as were deemed necessary. We started the audit on May 10, 1993, and it is ongoing. We limited the scope of the audit to Advanced Materials and Electronic Devices (Microelectronics) Research and Development Laboratories. The Director, Defense Research and Engineering (DDR&E), provided technical assistance by assigning a Staff Specialist for Materials and Structures to assist the audit team in analyzing R&D program documentation and evaluating facilities and laboratory equipment.

The R&D program documentation and other relevant information was obtained and is being analyzed for the most recent 3-year period, dated from FY 1991 through FY 1993. We are also evaluating Project Reliance implementation agreements among the Military Departments for evidence of cooperation, collocation, or Military Department leads in the specified technology areas and to verify cost avoidance claimed by Project Reliance in response to DMRD 922 initiatives. Appendix I lists organizations we visited or contacted.

Internal Controls

We evaluated internal controls to determine their adequacy for evaluating new facilities and equipment for DoD laboratories. The audit identified material internal control weaknesses as defined by DoD Directive 5010.38, "Internal Management Control Program," April 14, 1987. Controls were not effective to ensure that financial data submitted by both the DoD and the Army to the 1991 BRAC Commission were complete and accurate. Amendments to Public Law 101-510 "Defense Base Closures and Realignments" subsequently imposed additional controls on this process.

Specifically, provisions of law relating to BRAC, as amended by Public Law 102-590, December 31, 1992, now require that the Secretaries of the Military Departments and the heads of Defense Agencies submitting information to the Secretary of Defense or the BRAC Commission concerning the closure or realignment of a military installation shall certify that such information is accurate and complete to the best of that person's knowledge and belief. In view of that additional requirement governing future BRAC phases, we are not making recommendations in this report regarding internal management controls. A copy of our final report will be provided to the senior official responsible for internal controls within the Office of the Secretary of Defense and the Army.

Prior Audits and Other Reviews

The General Accounting Office (GAO) has recently completed two reviews related to the consolidation of DoD laboratories. In addition, the IG, DoD, has issued two audit reports on base closures and realignments within the Naval Surface Warfare Center.

General Accounting Office Reviews. Report No. GAO/NSIAD-92-316 (OSD Case No. 9211), "Military Bases: Navy's Planned Consolidation of RDT&E Activities," August 20, 1992, concluded that the Navy's April 1991 estimated costs for military construction for the Navy laboratory consolidation had not changed materially since the Navy submitted its estimates to the BRAC Commission. The report also concluded that DoD is taking steps to reduce duplication among the Military Departments in common research areas through the Tri-Service Science and Technology Reliance Program.

Report No. GAO/NSIAD-93-150 (OSD Case No. 9391), "Military Bases: Army's Planned Consolidation of RDT&E Activities," April 29, 1993, concluded that the Army's April 1991 estimated costs for military construction for the Army Research Laboratory consolidation have increased slightly. The estimated savings from the Army consolidation will result from the elimination of 774 civilian positions.

Inspector General Reports. Report No. 93-092, "Base Closure and Realignment Budget Data for the Naval Surface Warfare Center," was issued April 29, 1993. The audit objective was to evaluate increases in military construction project costs for base realignment and closure over the estimated costs provided to the BRAC Commission. This review concentrated on the realignments of portions of three facilities to Naval Surface Warfare Center (NSWC), Dahlgren Division, and another activity from the Annapolis Detachment to the Philadelphia Detachment of the Carderock Division. The report concluded that project costs, at a combined cost of $36.5 million for two construction projects, were overstated by at least $4.8 million. The audit questioned an additional $9.8 million.

Report No. 93-052, "Base Closure and Realignment Budget Data for the Naval Surface Warfare Center," was issued February 10, 1993. The objective of the audit was to evaluate increases in military construction project costs for base realignment and closure over the estimated costs provided to the BRAC Commission. This audit focused on the realignment of two NSWC elements to Dahlgren, Virginia, and of another facility to Carderock. The audit concluded that the costs for the Dahlgren project, estimated at $33 million, were overstated by $18.4 million and that the costs for the two Carderock projects, estimated at a total of $26.5 million, were understated by $7.5 million.

Part II - Finding and Recommendations

New Construction of Advanced Materials Laboratories

The Army and Navy are both planning to build and equip new laboratories for advanced materials research and development that may not be required. When analyzing the need for these new laboratories, the Army and Navy did not consider a DoD perspective. As a result, the Army and Navy will soon be negotiating contracts to spend more than $160 million for new building construction and new equipment, while the Air Force has underutilized laboratory space and equipment available. Considering the need for those projects from a DoD perspective could avoid the expenditure of a significant portion of the $160 million.

Background

In 1988, the BRAC Commission decided to permanently close the Army Materials Technology Laboratory in Watertown. After some debate as to where to locate the Materials Laboratory the Army, with BRAC approval, decided to build a new advanced materials laboratory at Aberdeen Proving Ground (Project No. 38227) (Appendix A). The total estimated project cost for this new laboratory is $109 million, which includes $80.5 million for a new building and $28.4 million for new equipment.

In FY 1990, the Navy Composite Materials Laboratory was slated for construction at the NSWC, Annapolis, as a productivity investment funds project. However, the 1991 BRAC Commission realignment of the Ship Materials Engineering Department required the project to be relocated to NSWC, Carderock, and funded as a BRAC Military Construction project. Accordingly, the Navy decided to build a new Composite Materials Laboratory as a wing to a new Ship Materials Technology Facility at a combined estimated cost of $37.6 million. However, a separate IG, DoD, Report No. 93-052, "Defense Base Closure and Realignment Budget Data for the Naval Surface Warfare Center," February 10, 1993, concluded that the combined construction costs for the buildings estimated by the Navy at $26.5 million were understated by $7.5 million. Therefore, the buildings could cost as much as $34 million, plus an additional $11.1 million for equipment. The total project could cost as much as $45.1 million.

Specifically, the Navy estimated the Composite Materials Laboratory (Project No. P-172S) (Appendix B) to cost $4.6 million. A new laboratory building was estimated to cost $3.5 million and new equipment installed for an estimated $1.1 million. The Ship Materials Technology Facility (Project No. P-179S) (Appendix C) was estimated to cost $23 million. The Navy also plans to relocate and re-install equipment at an estimated cost of $10 million.

The Navy also plans to build an advanced materials laboratory costing $13.9 million for naval aircraft (Project No. P-920S) (Appendix D) at Patuxent River, Maryland. A new 65,000-square-foot laboratory building would be constructed at an estimated cost of $12 million and equipment procured and installed at an estimated cost of $1.9 million. This project relates to the 1991 BRAC Commission realignment of the Naval Air Development Center at Warminster, Pennsylvania, to the Naval Air Warfare Center, Aircraft Division, at Patuxent River.

The Air Force Materials Directorate at Wright Laboratory has significant underutilized facilities and equipment already in place at Wright Laboratory that appears to be suitable for advanced materials research and development projects being conducted by the Army and Navy.

Facility and equipment requirements for research and development projects are determined by the specific types of advanced materials science and technology projects each laboratory performs. Appendix E lists the types of research projects identified by the Project Reliance Advanced Materials Technology Panel. With relatively few exceptions, the Army, Navy, and Air Force are conducting advanced materials science and technology research projects that require common types of laboratory space and equipment. Unique Army advanced materials projects are limited to armor materials, chemical and bio-protection materials, and smoke obscurants. Unique Navy advanced materials projects are limited to magnetic, piezoelectric and magneto-strictive materials, and fire-retardant materials. The only unique Air Force advanced materials science and technology use is for space-based hardened materials.

The Army is planning to relocate approximately 100 scientists and engineers from its existing facility at Watertown to Aberdeen Proving Ground. Since the new ARL laboratory is planning to employ a total of 221 personnel, approximately 121 new personnel will be recruited to work at Aberdeen Proving Ground to replace those who are not expected to relocate. Of the total 221 personnel planned to work at this new facility, 178 would be scientists and engineers.

The Navy is planning to transfer 185 laboratory employees from Annapolis to Carderock. The types of science and technology projects conducted by the Army and the Navy appear to be very suitable for application in the excess space available at the Materials Directorate at Wright Laboratory.

Project Reliance

DMRD No. 922 originally proposed that the Under Secretary of Defense for Acquisition develop a comprehensive management plan to control the efforts of the Military Departments in order to increase efficiency and reduce the cost of the Department's Research, Development, Test and Evaluation (RDT&E) operations. Two primary alternatives were considered as part of this DMRD: The first alternative sponsored by the Military Departments proposed the Tri-

Service Science and Technology Reliance (Project Reliance). The second alternative would have created a Defense Science, Engineering and Test Agency to centrally manage and operate all DoD Science and Technology activities. Concerned about perceived risks associated with this approach, the Deputy Secretary of Defense approved implementation of Project Reliance, even though estimated savings were significantly higher with the centrally managed alternative. Accordingly, upon approval of Project Reliance, a savings baseline of $1.1 billion was established for the Military Departments for the FYs 1992 through 1997 Future Years Defense Plan.

The objectives of Project Reliance are to enhance the quality of Defense Science and Technology activities; ensure the existence of a critical mass of resources that will develop "world class products"; reduce redundant science and technology capabilities and eliminate unwarranted duplication; gain productivity efficiency through collocation and consolidation of in-house Science and Technology work, when appropriate; and preserve the mission-essential capabilities of the Military Departments throughout the process. The Joint Directors of Laboratories (JDL) were given responsibility for managing the Reliance implementation process by the Deputy Secretary of Defense.

The JDL established 13 technology panels. One technology panel concentrates on basic research. The other twelve technology panels are responsible for developing the Joint Services Program Plan detailing the formal planning agreements for the individual technology programs. The advanced materials technology panel is one of these 12 panels. The technology panel for advanced materials further defined specific categories of research into taxonomy elements which are listed in Appendix E. The JDL seems to have used the terms "collocation" and "consolidation" solely on the basis of funding sources. Such use appears to have little to do with the physical collocation or consolidation of personnel, facilities, and equipment.

Neither Project Reliance nor the JDL has been analyzing or justifying the ARL or NSWC advanced materials laboratories. The DDR&E has had only limited involvement with Project Reliance. The current JDL organization has resulted in "rule by committee," so that when the Military Department representatives cannot reach agreement on a particular topic, there is no mechanism to resolve differences of opinion.

Base Realignment and Closure Commission

Public Law 101-510, the Defense Base Closure and Realignment Act for FY 1990, established a new process for DoD BRAC actions that governs all DoD recommendations through the year 1995. This new Act directed formation of an independent BRAC Commission to review recommendations made by DoD during the next 5 years. Recommendations were to be based on a force structure plan submitted as part of the FYs 1992 through 1996 budgets. The

BRAC process begins with recommendations by the Military Departments rather than the Commission developing its own list. Specifically, the approved realignments of the 1991 BRAC Commission related to the Army Research Laboratory and Naval Surface Warfare Center would result in:

o closing the Harry Diamond Laboratory in Woodbridge, Virginia;

o moving the Materials Directorate of the Army Research Laboratory from Watertown, to Aberdeen Proving Ground;

o closing the Naval Surface Warfare Center, Carderock Division, Ship Materials Technology Facility, currently located in Annapolis; and

o building the Composite Materials Laboratory, as a wing to the new Ship Materials Technology Facility, planned for Carderock.

Differences in Policy Interpretations

Two disparate interpretations regarding the need for new advanced materials laboratories demonstrate the need for clear policy and guidance on the consolidation of DoD Laboratories during downsizing.

First, a Military Department interpretation showed that the Army Research Laboratory and Naval Surface Warfare Center personnel apparently used the BRAC process to justify building and equipping new laboratories for advanced materials research that will cost an estimated $160 million. In doing so, the Army and the Navy have not considered, analyzed, or justified these construction projects from a DoD perspective. As a result, new Army and Navy Research Laboratories could be built unnecessarily.

A second policy interpretation related to the need for new DoD laboratories is best summarized by two significant conclusions of the Congressional Research Service in its report "Defense Laboratories: Proposals for Closure and Consolidation," January 24, 1991. Specifically, regarding the Military Departments' Laboratory Consolidation Proposals, the Congressional Research Service concluded:

> Everyone does not agree on what is meant by consolidation. For example, the Air Force's initial restructuring plan really focuses on the consolidation of management activities within its laboratories. In the near term, it does not appear that the Air Force plans to close or to consolidate any laboratories.

The Congressional Research Service further concluded:

> Utilizing the Base Closure Commission will allow the Services to avoid a comprehensive review of their entire laboratory restructuring proposals. The Laboratory Consolidation and Conversion Commission could quickly become irrelevant if the Army and Navy

successfully utilize the 1991 Base Closure Commission as an avenue to close some of their R&D laboratories. Some officials at DoD contend that if the Services' laboratory restructuring proposals are accepted by the new base closure commission, the Laboratory Consolidation and Conversion Commission recommendations will be too late and probably ignored by the Services.

Conclusion

The Army is planning on building and equipping a major new laboratory facility for advanced materials research as part of the ARL. The Army feels that by locating this laboratory at Aberdeen Proving Ground with other multi-discipline scientists and engineers, they can achieve a form of "technological synergism." In theory, this technological synergism would result in productivity enhancement that would flow from the combination of several ingredients: quick assembly of creative blends of talent and technology, more effective communication and coordination, and ease of technology transfer. The Army also believes that a "critical mass" of talent fundamental to worthwhile research will result from providing procedures and quality facilities. Simultaneously, the Army believes that this "flagship" research laboratory should be close to its customers.

Concurrently, in addition to an existing Advanced Materials Laboratory at the Naval Research Laboratory in Washington, DC, the Navy is planning on building several new laboratory facilities for conducting advanced materials research. Two of these new facilities would be located at Carderock approximately 15 miles from the location of its existing advanced materials laboratory at the Naval Research Laboratory. The third advanced materials research facility would be built at Patuxent River approximately an hour's drive from either the Carderock Facility or the Naval Research Laboratory.

Before beginning our audit, these projects had not been analyzed by either the DDR&E or the Project Reliance JDL. The combined estimated cost for these laboratory facilities exceeds $160 million; and when analyzed from a DoD perspective, none of these advanced materials laboratories may be needed. In addition, if these advanced materials facilities could be consolidated or collocated in vacant and underutilized space at the Materials Directorate of Wright Laboratory, the effects of "technological synergism" and the benefits of creating a "critical mass" of talent fundamental to worthwhile research would be even greater in a joint-Military Department environment than it would be in a "flagship" Army laboratory.

Given the emphasis placed by the Army on locating a research laboratory close to its customers and considering the fact that the primary area of Army advanced materials research is armor and anti-armor materials, it is important to note that the Tank and Automotive Command in Warren, Michigan, is significantly closer to Dayton, Ohio (Wright Laboratory), than it is to Aberdeen Proving Ground.

Recommendations

1. We recommend that the Under Secretary of Defense for Acquisition and Technology direct the Defense Science Board to study the need for the new Army and Navy Advanced Materials Laboratories from a Department of Defense perspective and provide appropriate input into the 1995 Base Realignment and Closure process. This Defense Science Board study should explore reasonable alternatives to new construction at Aberdeen Proving Ground, Carderock, and Patuxent River, and advise the Secretary of Defense on whether continuing the projects as currently approved is in the best interest of the Department of Defense.

2. We recommend that the Comptroller of the Department of Defense withhold military construction funds for these projects until an independent and objective analysis has reevaluated the need for new Army and Navy Advanced Materials Laboratories.

Management Comments and Audit Response

The Director of Defense Research and Engineering responded for the Under Secretary of Defense for Acquisition and Technology and indicated that while there may be advantages to collocating the Army and Navy Materials Research Laboratories at Wright Patterson Air Force Base, they were advised that the 1991 BRAC Commission realigns the Army Materials Technology Laboratory to the Aberdeen Proving Ground in Maryland and that this decision precludes consideration of other alternatives. Based on this advice, they stated they were unable to concur with the recommendation to initiate a Defense Science Board Study of this issue.

Audit Response. We urge the Director of Defense Research and Engineering to reconsider its position which may be based on the premise that the 1991 BRAC decision cannot be altered even by the 1995 BRAC Commission. The wording of our recommendation has been altered to make it clear that any recommendations not to implement the 1991 BRAC plan must go to the 1995 BRAC Commission.

We understand that a Defense Science Board Task Force on Defense Laboratory Management has been chartered by the DDR&E. This Task Force has been charged with developing a strategy for restructuring and substantially reducing the size of the defense laboratory infrastructure. The Task Force was directed to consider all Defense laboratories which perform work ranging from basic research, through technology development and acquisition support, to in-service

engineering and maintenance support (essentially all DoD efforts funded under category 6). The formation of this Defense Science Board Task Force and the charter assigned to it substantially satisfies our recommendation to the Under Secretary of Defense for Acquisition and Technology to study the need for new advanced materials laboratories from a DoD perspective.

As part of the 1995 BRAC, the Under Secretary of Defense has established six Joint Cross-Service Groups to examine areas with significant potential for cross-service impacts. One of these six specific Joint Cross-Service Groups was established to examine DoD laboratories. Policy guidance issued for the 1995 BRAC by the Deputy Secretary of Defense specifically states that DoD components may propose to the BRAC 95 changes to previously approved designated receiving base recommendations of the 1988, 1991, and 1993 Commissions. These proposed changes should be necessitated by revisions to force structure, mission or organization, or significant revisions to cost effectiveness that have occurred since the relevant commission recommendation was made. If the Army and Navy proceed with plans to build new Advanced Materials Laboratories, this preemptive action would foreclose any meaningful recommendation resulting from an analysis by the Joint Cross-Service Group established for laboratories.

The Comptroller of the Department of Defense stated that a temporary hold was placed on FY 1994 military construction funding, pending a ruling by the Office of the General Counsel of the legal implications. The Comptroller also suggested that if the proposed reports are finalized and issued, the recommendation for the Comptroller to withhold funding be made contingent upon action by the Under Secretary of Defense for Acquisition and Technology to commission an independent study. The Comptroller suggested that the 1995 BRAC process would provide an opportunity for study of this issue from a Department of Defense perspective. The Comptroller further states that the only effective way to modify the 1991 BRAC Commission's recommendations is to propose changes to the 1995 BRAC Commission.

Audit Response. We consider the comments from the Comptroller of the DoD to be responsive. We agree that the 1995 BRAC process would provide an opportunity for study of this issue from a DoD perspective.

The Department of the Army nonconcurred with the audit report recommendations, stating that the report was factually inaccurate, badly flawed in logic, and the conclusions were legally objectionable. The Army also stated that the report is "unencumbered by the facts" and the conclusions are "legally objectionable" because it assumes authority to disregard binding recommendations of the 1988 and 1991 BRAC Commissions.

The Army also states that if the report is finalized in its current form, it will severely reduce the Army's science and technology capability and seriously impair the Secretary of Defense's legal responsibility to implement the recommendations of the BRAC Commissions in a timely manner. The Army feels that it is imperative that the issues and errors identified in the Army response be resolved in the final audit report. The Army further recommends that if resolution does not occur, the report should not be finalized and issued. The Army enclosed a copy of a point-by-point rebuttal to the subject draft audit report that we have included in Appendix F.

Audit Response. We feel that the overall Army nonconcurrence as stated above is disingenuous. In its response, the Army submitted nothing in the form of information that could be verified and audited that would demonstrate factual inaccuracies in the draft report. Other than its opinion that the draft report was badly flawed in logic, the Army offered no evidentiary matter to contradict the draft report logic.

Regarding the Army claim that the draft report was legally objectionable, the Army may have misunderstood the draft report recommendation as assuming the 1991 BRAC decisions could be altered without recourse to the 1995 BRAC Commission. This was not our intent and the wording in the recommendation has been clarified. In any event, we agree with the Army Office of the Judge Advocate General letter dated November 24, 1993, page 6, paragraph 4, "If circumstances warrant, the SECDEF may submit additional recommendations to the 1995 Commission to revise the earlier Commissions' recommendations." These comments were concurred with by the Army Office of General Counsel in a letter dated November 29, 1993 that stated: "The DoD IG may well feel that the BRAC 91 recommendations regarding laboratory realignments should be revisited. The DoD IG however, should include in any final reports the warning that the decried realignments must take place unless DoD undertakes to seek their modification in BRAC 95." We agree that the entire concept of the Army Research Laboratory should be revisited by BRAC 95.

In a January 7, 1994, letter regarding the 1995 BRAC, the Deputy Secretary of Defense stressed the need to emphasize cross-service utilization of common support assets. Policy guidance attached to this letter concerning changes to previous recommendations specifically states: "DoD components may propose changes to previously approved designated receiving base recommendations of the 1988, 1991, and 1993 Commissions provided such changes are necessitated by revisions to force structure, mission or organization, or significant revisions to cost effectiveness that have occurred since the relevant commission recommendation was made."

With regard to the Army point-by-point rebuttal to the subject draft audit report (Appendix F), we have prepared a detailed point-by-point audit response that addresses each issue. This detailed audit response is included in the audit report as Appendix G. To preclude preemptive actions on the part of the Army to make moot any recommendations to the BRAC 95, we continue to recommend that the Comptroller of the Department of Defense withhold military construction funds for these projects until the need for new Army and Navy

Advanced Materials Laboratories is evaluated by the Defense Science Board and the BRAC 95 Joint Cross-Service Group for Laboratories.

The Department of the Navy nonconcurred with the audit report finding and recommendations, stating that the Navy had demonstrated a need for the planned materials facilities as part of the 91 and 93 BRAC process. The Navy stated that further review of all Navy RDT&E infrastructure, including materials application and research facilities, will be conducted during BRAC 95. The Navy believes that disruption of Navy planned construction would seriously undermine implementation of BRAC legal requirements and overall plans to consolidate RDT&E facilities.

Audit Response. We agree that the Navy RDT&E infrastructure, including materials application and research facilities, should be reviewed as part of the BRAC 95 Cross-Service Group for Laboratories. However, continuation of planned Navy construction would preempt any possible recommendations that would result from the BRAC 95 Cross-Service Group for Laboratories.

As we discussed in our audit response to Army Management Comments above, the policy guidance contained in the 1995 BRAC specifically states that "DoD components may propose changes to previously approved designated receiving base recommendations of the 1988, 1991, and 1993 Commissions provided such changes are necessitated by revisions to force structure, mission or organization, or significant revisions to cost effectiveness that have occurred since the relevant commission recommendation was made." Accordingly, we are continuing to recommend that the Comptroller of the DoD withhold military construction funds for these Navy projects until an independent and objective analysis has reevaluated the need for these new Navy Advanced Materials Laboratories. This independent and objective analysis can and should be conducted by the Defense Science Board concurrent with the BRAC 95 Cross-Service Group for Laboratories.

The Department of the Air Force did not comment on legal or contractual issues regarding the proposed new advanced materials laboratories. The Air Force did however, agree that an independent assessment by outside technical experts, such as the Defense Science Board, would be of value in technically assessing unique aspects of laboratory facility utilization. The Air Force recommended that if such an assessment is conducted, a "two laboratory option" alternative be considered. The Air Force explained that the two laboratory alternative would consist of a joint Services air and space materials and processes laboratory led by the Air Force at Wright Laboratory and the second alternative would be a joint Services land and sea materials and processes laboratory led by the Army or Navy at a site or sites to be determined. The Air Force also stated that it believed that there is much more value that can be obtained from a more vigorous application of the Tri-Service Reliance process to total program content, and also to identify and resolve major facility and equipment issues.

Audit Response. We agree that an independent assessment by outside technical experts, such as the Defense Science Board, would be valuable in evaluating the unique aspects of laboratory facility utilization. We also agree with the Air Force that there is much more value that can be obtained from a more vigorous application of a Joint Cross-Service process to identify and resolve major facility and equipment issues as well as total program content.

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Part III - Additional Information

Appendix A. Army Research Laboratory Military Construction Project

Aberdeen Proving Ground, Maryland

Advanced Materials Laboratory

Proposed Area	Square Feet	Proposed Cost
Laboratory	172,132	$43,493,000
Laboratory Offices	40,176	4,823,000
Administrative Offices	4,775	408,000
Special Use Areas	9,100	1,092,000
Mechanical /Electrical Space	57,224	14,788,000
HAZMAT[1] Storage Facility	3,807	942,000
HAZMAT Waste Storage Facility	1,410	207,000
IDS[2] Installation		88,000
Industrial Wastewater Treatment Facility	2,000	425,000
Building Information Systems		897,000

[1] Hazardous Material
[2] Intrusion Detection System

Aberdeen Proving Ground, Maryland

Advanced Materials Laboratory

Supporting Facilities	Proposed Cost
Electric Service	$981,000
Water, Sewer, and Gas	610,000
Paving, Walks, Curbs, and Gutters	830,000
Storm Drainage	696,000
Site Improvements	1,903,000
Information Systems	98,000
Traffic Control and Light	45,000
Other	
Contingency at 5 percent	3,616,000
Supervision, Inspection, and Overhead at 6 percent	4,557,000
Sub-Total Building and Related Facilities	$ 80,499,000
Installed Equipment - Other Appropriations	28,390,000
Project Total	$108,889,000

Appendix B. Naval Surface Warfare Center Carderock Division, Composite Materials Laboratory

Carderock, Maryland

Composite Materials Laboratory

Proposed Area	Square Feet	Proposed Cost
Building	15,480	$2,370,000
Built-In Equipment		320,000
Supporting Facilities		
Utilities		290,000
Paving and Site Improvements		160,000
Other		
Contingency at 5 percent		160,000
Supervision, Inspection, and Overhead at 6 percent		200,000
Sub-Total Building and Related Facilities		$3,500,000
Equipment Provided From Other Appropriations		1,060,000
Project Total		$4,560,000

Appendix C. Naval Surface Warfare Center, Carderock Division, Ship Materials Technology Facility

Carderock, Maryland

Ship Materials Technology Facility

Proposed Area	Square Feet	Proposed Cost
Building	120,000	$15,240,000
Covered Storage	7,000	350,000
Open Storage	8,000	120,000
Built-In Equipment		1,300,000
Supporting Facilities		
Electrical Utilities		1,900,000
Mechanical Utilities		1,000,000
Paving and Site Improvements		760,000
Other		
Contingency at 5 percent		1,030,000
Supervision, Inspection and Overhead at 6 percent		1,300,000
Sub-Total Building and Related Facilities		$23,000,000
Equipment Relocation/Other Appropriations		10,000,000
Project Total		$33,000,000

Appendix D. Naval Air Warfare Center, Aircraft Technologies Laboratory, Patuxent River, Maryland

Aircraft Technologies Laboratory

Proposed Area	Square Feet	Proposed Cost
Building	65,000	$8,060,000
Technical Operating Manuals		70,000
Supporting Facilities		
Electrical Utilities		1,290,000
Mechanical Utilities		1,140,000
Paving and Site Improvements		220,000
Other		
Contingency at 5 percent		540,000
Supervision, Inspection and Overhead at 6 percent		680,000
Sub-Total Building and Related Facilities		$12,000,000
Equipment Relocation		
Other Appropriations		1,940,000
Project Total		$13,940,000

Appendix E. Joint Directors of Laboratories Panel for Advanced Materials

	Army	Navy	Air Force
Structural Materials			
o Metallic Alloys and Composites - Ferrous Metals - Non-Ferrous Metals - Metal Matrix Composites	Yes	Yes	Yes
o Non-Metallic and Composites Materials - Thermoset Composites - Thermoplastic Composites	Yes	Yes	Yes
High Temperature Materials			
o Metals and Intermetallics - Titanium Based - Superalloys - Advanced Intermetallics	Yes	Yes	Yes
o Ceramics - Monolithic - Composites	Yes	Yes	Yes
o Carbon-Carbon Composites - Materials and Processes - Applications		Yes	Yes
Armor and Anti-Armor Materials			
o Armor Materials - Materials and Processes - Metallic Armor Materials - Ceramic Armor Materials - Composites	Yes		

Appendix E. Joint Directors of Laboratories Panel for Advanced Materials

	Army	Navy	Air Force
o Anti-Armor Materials - Penetrator and Sabot Materials - Warhead Materials - Launcher Materials for Conventional and Advanced Gun Systems	Yes	Yes	
o Materials Dynamics	Yes	Yes	
Electromagnetic Protection Materials			
o Ground-Based Electromagnetic Protection Materials	Yes	Yes	Yes
o Space-Based Hardened Materials		Yes	
Electronic, Magnetic, and Optical Materials			
o Semiconductor Materials - Bulk Materials - Thin Films	Yes	Yes	Yes
o Non-Linear Optical Materials - Organic Thin Films - Inorganic Thin Films - Bulk Crystals	Yes	Yes	Yes
o Superconductor Materials - Materials and Process Development - Materials for Power Applications - Materials for Magnetic Sensor Systems		Yes	Yes
o Electromagnetic Transparency Materials - Visible Transparencies - Infrared/Multimode Transparencies - Microwave Transparencies	Yes	Yes	Yes
o Magnetic, Piezoelectric, and Magneto-Strictive Materials - High Coersive Force Materials - Piezoelectric and Magneto-Strictive Materials	Yes		
o Electro-Ceramic Materials		Yes	

Appendix E. Joint Directors of Laboratories Panel for Advanced Materials

	Army	Navy	Air Force
Special Function Materials			
o Fire Retardant Materials		Yes	
o Paints, Coatings, and Cleaning Materials	Yes	Yes	Yes
o Fluids and Lubricants	Yes	Yes	Yes
o Elastomers and Seal	Yes	Yes	Yes
o Chemical and Bio-Protection Materials	Yes		
o Thermal Management		Yes	Yes
Bio-Molecular Materials and Processes			
o High Temperature Materials	Yes	Yes	Yes
o Armor and Anti-Armor	Yes		
o Electromagnetic Shielding	Yes	Yes	Yes
o Electrical, Magnetic, and Optical Materials	Yes	Yes	Yes
o Special Function Materials	Yes	Yes	Yes
o Material Processing, Manufacturing	Yes	Yes	Yes
o New Material Concepts	Yes	Yes	Yes
Materials Processing/ Manufacturing Research			
o Process Modeling and Control - Expert Systems	Yes	Yes	Yes
o Forming and Net Shape Processing - Spray Forming	Yes	Yes	Yes
o Joining - Adhesives - Welding	Yes	Yes	Yes

Appendix E. Joint Directors of Laboratories Panel for Advanced Materials

	Army	Navy	Air Force
Non-Destructive Inspection Evaluation (NDI/E)[1] Technology			
o Advanced Materials and Process Development NDE[2]	Yes	Yes	Yes
o Manufacturing NDI/E	Yes	Yes	Yes
o In-Service Performance Integrity/Life Monitoring	Yes	Yes	Yes
Materials Transition/Technology Demonstration			
o Signature Control Materials	Yes	Yes	Yes
o Radar Materials	Yes	Yes	Yes
o Optical Materials	Yes	Yes	Yes
o Smoke Obscurants	Yes		
o NDE/Inspection	Yes	Yes	Yes

[1] NDI/E - Non-Destructive Inspection/Evaluation
[2] NDE- Non-Destructive Evaluation

Appendix F. Army Point-By-Point Comments

ARMY COMMENTS
ON THE
"DRAFT QUICK-REACTION REPORT
ON ADVANCED MATERIALS
RESEARCH, DEVELOPMENT, TEST
AND EVALUATION
LABORATORIES WITHIN DOD"

ARMY COMMENTS
ON THE
"DRAFT QUICK-REACTION REPORT ON ADVANCED MATERIALS RESEARCH, DEVELOPMENT, TEST AND EVALUATION LABORATORIES WITHIN DOD"

Part I - Introduction

Executive Summary - **NONCONCUR.** The Army strongly disagrees with the statements made in the Executive Summary. The Army Research Laboratory (ARL) was officially formed in October 1992 after years of study of the Department of Defense (DOD) and the Department of the Army's (DA) research and development community by both internal and external groups. The most recent studies, LAB 21, the 1991 Base Realignment and Closure (BRAC) Commission, and the Federal Advisory Commission on Consolidation and Conversion of Defense Research and Development Laboratories, each specifically endorsed the concept of a consolidated, multi-disciplinary "world class" Army Research Laboratory.

The ARL is the corporate laboratory for the Army, providing a research capability to enable the Army to meet the warfighting challenges of the future battlefield. Such a corporate laboratory must have a strong in-house research capability with a critical mass of work in key technology areas. Electronics and materials are fundamental technologies and constitute core competencies for the laboratory. State-of-the-art research facilities and equipment must be made available to attract and retain a highly competent and dedicated work force. The Army is committed to the planned investment in ARL.

Background (pg. 2-3)

- Page 2, Paragraph 2 - "During FY 1991, the Army operated 43 laboratories, centers and institutes that employed approximately 30,500 military and civilian personnel. Total Army funding for those laboratories in FY 1993 was $6.0 billion."

-- *Army Comment* - Nonconcur. The paragraph is incorrect and misleading, revise to read as follows: "The Army currently operates 21 laboratories, centers, and institutes that employs approximately 29,000 civilian personnel and military personnel. Total funding for these activities was $4.0 billion in FY 93."

Rationale --Accuracy and completeness.

- Page 2, Paragraph 4, sentence 1 - "Because of the condition of its facilities and infrastructure, the 1988 Base Realignment and Closure (BRAC) Commission recommended that the Army Materials Technology Laboratory in Watertown, Massachusetts, be permanently closed."

-- *Army Comment*- Nonconcur. Sentence is incorrect and misleading. Revise to read as follows: "Because of the condition of its facilities and infrastructure, the 1988 Base Realignment and Closure (BRAC) Commission recommended that the Watertown, Massachusetts, site be closed and the mission of the Materials Technology

Laboratory be transferred to 3 separate sites."

Rationale --Accuracy and completeness.

• **Page 2, Paragraph 4, sentence 2** - "A major consideration for this conclusion was the need for major renovation or replacement of laboratory facilities."

•• *Army Comment* - Nonconcur. Delete.

Rationale --This sentence is redundant with the first sentence of the paragraph and is unnecessary to the reader's understanding of the rationale.

• **Page 2, Paragraph 4, sentence 3** - "To avoid the cost of construction, the 1988 BRAC Commission recommended relocating the laboratory."

•• *Army Comment* - Nonconcur. Delete

Rationale -- Accuracy This statement is incorrect since the FY91 BRAC I Budget Submit to Congress showed $29M for Military Construction in support of this proposed relocation

• **Page 2, Paragraph 5, first sentence** - "Based upon an appeal by the Army, the 1991 BRAC Commission subsequently modified the 1988 BRAC Commission recommendations and realigned the Materials Technology Laboratory to Aberdeen Proving Ground, Maryland, and approved establishment of the Combat Materials Research Laboratory (subsequently renamed the Army Research Laboratory in October 1992) at Adelphi, Maryland

•• *Army Comment* - Nonconcur. Revise as follows. "The Army BRAC 91 submission forwarded by the Secretary of Defense to the 1991 BRAC Commission recommends and realigns the Materials Technology Laboratory to Aberdeen Proving Ground, Maryland, and approved establishment of the Combat Material Research Laboratory (subsequently renamed the Army Research Laboratory in October 1992) at Adelphi, Maryland

Rationale -- Accuracy The Army submits their BRAC recommendations to DoD, who reviews and if approved, forwards to the BRAC Commission.

• **Page 2, Paragraph 5, last sentence** - " As a result of this 1991 BRAC decision, the ARL plans to build a new Advanced Materials Laboratory at Aberdeen Proving Ground, Maryland, to cost $109 million; a new Microelectronics Laboratory at Adelphi, Maryland, to cost $169 million; and a new Fuze Evaluation Facility at Redstone Arsenal, Alabama, to cost $3.0 million."

•• *Army Comment* – Nonconcur. Statement should be revised to read as follows: As a result of the 1991 BRAC decision, the Army plans to build a new Advanced Materials Research Facility at Aberdeen Proving Ground, MD, to cost $101.2 million

($80.0 million for Military Construction/$21.2 million for equipment)"; construct and renovate laboratories, scientists/engineers and general office space, and support facilities at Adelphi Laboratory Center, MD, to cost $135.4 million (102.1 million for Military Construction/$33.3 million for equipment)."

Rationale --Accuracy and completeness. The ARL is not building these facilities, the Army is. Furthermore, the Fuze Evaluation Facility at Redstone Arsenal, Alabama, is a MICOM project, not ARL.

• **Page 3, Paragraph 2** - "The realignment of the Materials Technology Laboratory will involve relocating approximately 100 scientific and engineering employees from the existing facility at Watertown, Massachusetts, to the proposed new laboratory at Aberdeen Proving Ground, Maryland. The new advanced materials laboratory plans to employ a total of 221 persons, of which 178 would be scientists and engineers."

•• *Army Comment* – **Nonconcur.** This should read. " The realignment of the Materials Directorate will involve relocating 181 personnel from Watertown, MA, and 40 personnel from Belvoir RDEC, Ft. Belvoir, VA, who have transfer of function rights to the proposed new laboratory at Aberdeen Proving Ground, MD. The Materials Directorate at APG will employ 221 personnel, of which 189 will be scientists and engineers."

Rationale– Accuracy and completeness

• **Page 3, Paragraph 3, last sentence** - " Total implementation cost for the Army Research Laboratory including new laboratory construction and personnel-related costs were estimated to be $415 million in the Army's FY 1994 "Justification Submitted to Congress," March 1993 "

•• *Army Comment* --**Nonconcur.** The last sentence should be deleted and replaced with the following "The FY95 BRAC 91 Budget Submit to Congress shows the implementation costs for ARL to be approximately $370 million." Also remember that the Microelectronics Research Facility has been reduced in scope since the BRAC budget submit and that the total cost is now estimated to be approximately $365 million

Internal Controls (Pg. 5) --
•• *Army Comment* – **Nonconcur.** Delete paragraphs.

Rationale -- The Army strongly disagrees with the reports contention that internal controls were not effective to ensure financial data submitted to the 1991 Defense Base Realignment and Closure Commission was complete and accurate. This contention is completely unsubstantiated, as the report does not identify that any specific internal control weaknesses existed. Nor does it identify what questionable data was submitted to the Commission. In their May 1991 audit report (GAO/NSIAD-91-224) the General Accounting Office (GAO)concluded that the Army's realignment recommendations to the 1991 Commission were adequately supported. Moreover, in another re-

port (April 1993 GAO/NSIAD-93-150), the GAO found that construction costs of the Army Research Laboratory had increased only slightly. These General Accounting Office reports directly contradict the conclusions in the report that the financial data submitted to the commission wasn't complete or accurate. (see also Army Audit Agency Special Report, SR-92-702 below)

Prior Audits and Other Reviews (p.5-6)
~ *Army Comment* – Nonconcur. Add the following reviews:

"The Federal Advisory Commission on Consolidation and Conversion of Defense Research and Development Laboratories - Report to the Secretary of Defense," September 1991. Public Law 101-510 established the Federal Advisory Commission on Consolidation and Conversion of Defense Research and Development Laboratories to study the Department of Defense (DoD) laboratory system and provide recommendations to the Secretary of Defense on the feasibility and desirability of various means to improve the operation of DoD laboratories. Among the findings of the Federal Advisory Commission were that "the Army's proposed laboratory consolidation and realignment should result in a more effective laboratory structure....The Commission supports this proposed consolidation."

"Special Report by the U. S Army Audit Agency (AAA) - Base Realignment and Closure Construction Requirements," SR 92-702, 12 Aug 1992. At the request of the Director of Management, the Army Auditor General reviewed the BRAC 91 construction requirements to determine whether the requirements were adequately supported The AAA concluded "that the Major Commands and installations adequately supported the majority of their construction requirements and that they generally followed DA guidance for calculating construction requirements." Additionally, they concluded that "we observed that all parties, from DA through the installations, were concientious in their endeavors to make sure that the construction projects reflected essential facilities to meet the realigned missions." Where ARL requirements were not supported by the AAA the ARL adjusted the costs and square footage on the DD Form 1391 in accordance with the AAA recommendations.

Rationale --Completeness. These two studies are very significant to the subject of this report supported the creation of the Army Research Laboratory and thus should be noted and included

Part II - Findings and Recommendations

- Opening Paragraph (p.8) – " The Army and Navy are both planning to build and equip new laboratories for advanced materials research and development....."

-- *Army Comment*- Nonconcur. The Army strongly disagrees with the statements in this paragraph. Delete paragraph.

Rationale This summation is more appropriately placed at the end of this section and already exists.

Background (pp 8-10)

- Page 8, Paragraph 2 - "In 1988, the Base Realignment and Closure (BRAC) Commission decided to permanently close the Army Materials Technology Laboratory..."

-- *Army Comment*- Nonconcur. Delete. Replace with "In 1988, the Base Realignment and Closure (BRAC) Commission recommended that the Watertown, Massachusetts site be closed and the mission of the Materials Technology Laboratory be transferred to 3 separate sites. After detailed study, the Army, with BRAC 91 approval decided to locate a new advanced materials laboratory at Aberdeen Proving Ground Maryland (Project No 38227)(Appendix A). The total estimated project cost for this new laboratory is $101.2 million, which includes $80.0 million for a new building and $21.2 million for new equipment."

Rationale --Accuracy and completeness

- Page 9, Paragraph 3 - "The Air Force Materials Directorate at Wright Laboratory has significant underutilized facilities and equipment already in place ....."

-- *Army Comment*- Nonconcur. The Army strongly disagrees with the statements in this paragraph. Delete or provide information to substantiate this claim.

Rationale --The Tri-Service analysis indicates that this is not the case as presented in the attached (TAB A) summary. The Air Force Materials Laboratory and Building 450 at WPAFB have been identified through Army and Air Force discussions as possible sites to locate Army materials work. The space within the Materials Laboratory would only encompass some limited laboratory space. Bldg 450 would provide about one third of the necessary Army materials space requirements for office and lab space and entail extensive renovation of a circa 1959 building currently used primarily for office space. Thus, attempting to move both the Army and Navy materials laboratories to WPAFB would still entail extensive facilities construction to house these laboratories and their personnel.

- Page 9, Paragraph 4 - "Facility and equipment requirements for research and development projects are determined by the specific types of advanced materials....."

-- *Army Comment*– **Nonconcur.** The Army strongly disagrees with the statement made in the third sentence. Delete and add. "These projects are oriented at Service specific applications as demonstrated by the following examples from those listed in Appendix E:

- Ceramics - Army only DoD component developing monolithic ceramics for fin/flight surfaces for missiles and anti-armor KE penetrators.
- Armor materials - The Army performs all of the metallic, ceramic & composite armor materials R&D for DoD.
- Elastomers & Seals - Army unique mission to formulate, develop and evaluate improved elastomers for trackpads, bushings, and roadwheels for armored ground combat vehicles.
- Chemical & Bio-Protection Materials - Army is DoD Executive Agent and has lead due to ground troop exposure "

Rationale -- The Army materials research program is fully coordinated among the Services through the JDL Reliance panel on Advanced Materials The Army's efforts are aimed at meeting unique Army requirements not otherwise being addressed as well as supporting the Navy and Air Force in mission areas where the Army has unique expertise TAB B provides an expanded version of Appendix E, further highlighting the Army's materials research programs in the areas listed

- Page 9, Paragraph 5 - "The Army is planning to relocate approximately 100 scientists and engineers from its existing facility at Watertown, Massachusetts, to Aberdeen, ..."

-- *Army Comment*-- **Nonconcur** This should read " The realignment of the Materials Directorate will involve relocating 181 personnel from Watertown, MA, and 40 personnel from Belvoir RDEC, Ft. Belvoir, VA, who have transfer of function rights to the proposed new laboratory at Aberdeen Proving Ground, MD The Materials Directorate at APG will employ 221 personnel, of which 189 will be scientists and engineers "

Rationale -- Accuracy and completeness

- Page 9-10. Paragraph 6 - "The Navy is planning to transfer 185 laboratory employees from Annapolis to Carderock, Maryland. The types of science and technology projects conducted by the Army and the Navy appear to be very suitable for application in the excess space available at the Materials Directorate at Wright Laboratory."

-- *Army Comment*– **Nonconcur.** The Army strongly disagrees with the last statement of this paragraph. Delete or provide information from valid technical source to substantiate this claim as to the availability of sufficient office/laboratory space to meet the needs of the Army and Navy in addition to the Air Force.

Rationale-- The Tri-Service analysis (TAB A) contradicts this unsubstantiated assertion The Air Force Materials Laboratory and Building 450 at WPAFB have been identified through Army and Air Force discussions as possible sites to locate Army materials

work. The space within the Materials Laboratory would only encompass some limited laboratory space Bldg 450 would provide about one third of the necessary Army materials space requirements for office and lab space and entail extensive renovation of a circa 1959 building currently used primarily for office space. Thus, attempting to move both the Army and Navy materials laboratories to WPAFB would still entail extensive facilities construction to house these laboratories and their personnel.

Project Reliance (pp 10-11)

• Page 10, Paragraph 2 - "..... Concerned about perceived risks associated with this approach, the Deputy Secretary of Defense approved implementation of Project Reliance, even though estimated savings were significantly higher with the centrally managed alternative Accordingly, upon approval of Project Reliance, a savings baseline of $1.1 billion was established for the Military Departments for the FYs 1992 through 1997 Forward Years Defense Plan."

•• *Army Comment*– Nonconcur The Army recommends the last two sentences be deleted or revised to read as follows. "The Deputy Secretary of Defense selected Alternative 1 which is responsive to warfighters, improves technology transition throughout the life cycle, is fully responsive to 'new world' reality and past criticism, retains SAE authority and accountability and provides the DoD with the most potential savings."

Rationale – These statements are misleading, only discussing part of the reasoning behind the selection of Alternative 1 and in some aspects is incorrect One of the drawbacks of Alternative 2 was indeed the high risk due to the "abrupt, irreversible, fundamental change to the entire defense acquisition process" but the Defense Science Engineering and Test Agency (DSETA) also was "decoupled from the Service Acquisition Executives who would still be accountable for programs but would lose authority and resources". The paragraph does not touch on the positive aspects of Alternative 1. Technically speaking, the DepSecDef approved "Alternative 1," of which Project Reliance is an integral part. Additionally, the reference that the savings were "significantly higher with the centrally managed approach" is not correct.....according to the briefing presented to the DepSecDef on August 22, 1990, the total savings for Alternative 1 were $3.420 billion and for Alternative 2 were $2.938 billion, thus Alternative 1 presented more savings (NOTE: To be correct the FYDP stands for-" Future Years Defense Plan")

• Page 10, Paragraph 3 - ".....The JDL seems to have used the terms "collocation" and "consolidation" solely on the basis of funding sources. Such use appears to have little to do with the physical collocation or consolidation of personnel, facilities and equipment."

•• *Army Comment*– Nonconcur. The last two sentences should be altered and expanded as follows " The Joint Directors of Laboratories (JDL) were given programmatic oversight responsibilities for the Reliance implementation process by the Deputy Secretary of Defense These JDL responsibilities did not alter nor remove from the Service Acquisition Executives (SAE) their fiscal, command and control and infrastruc-

ture management functions over their components individual Science and Technology activities."

Rationale--Accuracy and completeness.

• **Page 11, Paragraph 1** - "Neither Project Reliance nor the JDL has been analyzing or justifying the ARL or NSWC advanced materials laboratories. The Director of Defense Research and Engineering (DDR&E) has had only limited involvement with Project Reliance. The current JDL organization has resulted in "rule by committee," so that when the Military Departments representatives cannot reach agreement on a particular topic, there is no mechanism to resolve differences of opinion."

•• *Army Comment*– **Nonconcur.** The first sentance should be deleted and the last two sentences should be revised to read as follows: "The Director of Defense Research and Engineering (DDR&E) has been heavily involved with Project Reliance and the JDL. Tab C shows the representation of not only DDR&E but also that of other DoD staff and agencies. The current JDL organization resolves disputes in two forums the JDL Principals Meetings and the OSD chaired Defense S&T Working Group Both groups have representation from DDR&E, the Tri-Service S&T Executives, and other DoD (DNA, ARPA, etc) agencies as appropriate To date, there have been no instances of problems which were unable to be resolved by these groups."

Rationale– Accuracy

<u>Base Realignment and Closure Commission</u>

• Page 11, Paragraph 2 - ".....Specifically, the approved realignments of the 1991 BRAC Commission related to the Army Research Laboratory and Naval Surface Warfare Center would result in:

o closing the Harry Diamond Laboratory in Woodbridge, Virginia;
o moving the Materials Directorate of the Army Research Laboratory from Watertown, Massachusetts, to Aberdeen Proving Ground, Maryland;
o closing the Naval Surface Warfare Center....."

•• *Army Comment*– **Nonconcur** Delete first and second bullet. List of 1991 BRAC actions associated with the Army Research Laboratory should read as follows.

• move the Army Research Institute MANPRINT function from Alexandria, Virginia, to Aberdeen Proving Ground (APG), MD.
• move the 6.1 and 6.2 materials elements from the Belvoir Research and Development Center, Virginia, to the ARL Materials Directorate at APG, MD.
• move the ARL Materials Directorate from Watertown, MA, to APG, MD, and close the Watertown facility.
• move the structures element of the former Materials Technology Laboratory from Watertown, MA, to the ARL Vehicle Structures Directorate at NASA-Langley, VA.
• move the Electronics and Power Sources Directorate (EPSD) personnel of the ARL (formerly NVEOL personnel) and Sensors, Signatures, and Signal Processing Directorate personnel of the ARL (formerly NVEOL personnel) from

Fort Belvoir, VA, to Adelphi, MD.
- move the EPSD from Fort Monmouth, NJ, to Adelphi, MD.
- move a portion of the ARL Battlefield Environment Directorate from White Sands Missile Range, NM, to Adelphi, MD.
- move the Woodbridge Research Facility personnel from Woodbridge, VA, to Adelphi, MD, and close the Woodbridge Facility.
- move the fuze production mission (armament related) from ARL-Adelphi to ARDEC, Picatinny Arsenal, NJ.
- move the fuze production mission (missile related) from ARL-Adelphi to MICOM, Redstone Arsenal, AL.

Rationale– Accuracy and completeness.

Differences In Policy Interpretations

- **Page 12, Paragraph 1 (continuation from previous page)** - "BRAC process to justify building and equipping new laboratories for advanced materials research that will cost an estimated $160 million. In doing so, the Army and Navy have not considered, analyzed or justified these construction projects from a DoD perspective. As a result, new Army and Navy Research Laboratories could be built unnecessarily."

– ***Army Comment***– Nonconcur The Army strongly disagrees with the statements in this paragraph This paragraph should be deleted.

Rationale The BRAC process was that which the Army was mandated to use for the materials laboratory action in accordance with the thresholds of 10 U.S C. 2687. The BRAC process was established such that the military services developed closure lists which are reviewed and approved by the DoD before submission to the independent commission established in PL 101-510 The review process at DoD ensures that the so-called "DoD perspective"has been applied for the Services submissions prior to consolidation of all the Services inputs into the final DoD BRAC report to the commission The responsibility for this review can not be delegated to the Services.

- **Page 12, Paragraph 2,3,4** - "A second policy interpretation related to the need for new DoD laboratories is best summarized by ....."

-- ***Army Comment***– Nonconcur. These paragraphs should be deleted.

Rationale The intent of the two Congressional Research Service quotes is unclear and confusing There appears to be no purpose for their inclusion as the alluded to policy interpretation is not stated anywhere. The first conclusion simply summarizes a typical management technique used to streamline and reduce overhead in organizations The third paragraph (second conclusion) is not really relevant to this discussion because it does not provide a discussion of the facts and occurrences since the report was issued Most notably is the finding from the Commission's report that "The Army's proposed laboratory consolidation and realignment should result in a more effective laboratory structure.....the commission supports this proposed consolidation."

Conclusion (pp 12-13)

- Page 13, Paragraph 3-4 - "Before beginning our audit, these projects had not been analyzed by either the DDR&E or the Project Reliance JDL. The combined estimated cost for these laboratory facilities exceeds $160 million, and when analyzed from a DoD perspective, none of these advanced materials laboratories may be need. In addition, if these advanced materials facilities could be consolidated or collocated in vacant and underutilized space at the Materials Directorate of Wright Laboratory, the effects....."

- *Army Comment*- Nonconcur. Delete.

Rationale --As previously stated, the DDR&E is consulted and may input laboratory consolidation issues during the DoD review of the Service's BRAC submissions. Also as stated previously, the claims of vacant and underutilized space at the Materials Directorate of Wright Laboratory are unsubstantiated. The recent Tri-Service analysis indicates that this is not the case. Furthermore, the Federal Advisory Commission concluded that "The laboratory types within each Service are a function of that Service's weapons systems acquisition structure. There is no need to force the Service laboratory systems into a single model." As far as "locating a research laboratory close to its customers", the Armor/Anti-Armor materials research accounts for only 18.75% ($3.0M of $16.0M core 6.1 and 6.2 funding) of the Army's Materials Program for FY 94. The remaining customers for the Army Material Laboratory products include the Weapons Technology and Advanced Computational & Information Sciences Directorates of ARL located at APG. APG also offers the availability of weapons and armor test ranges (both of which support TACOM), making it unnecessary to duplicate the existing ranges at Watertown, MA. In addition, the APG site offers close proximity to DoD University Research Initiatives (URI) working relevant materials research and technology development at the University of Delaware, Johns Hopkins University and the University of Maryland.

Recommendations for Corrective Action

- Page 13 - 14 - "1. We recommend that the Under Secretary for Acquisition direct the Defense Science Board to study the need for the new Army and Navy Advanced Materials Laboratories from a Department of Defense perspective. This Defense Science Board study should explore reasonable alternatives to new construction at Aberdeen Proving Ground, Maryland, Carderock, Maryland, and Patuxent River, Maryland and advise the Secretary of Defense on whether continuing the projects as currently approved is in the best interest of the Department of Defense. " and "2. We recommend that the Comptroller of the Department of Defense withhold military construction funds for these projects until an independent and objective analysis has reevaluated the need for new Army and Navy Advanced Materials Laboratories."

-- *Army Comment*-- Nonconcur. <u>The Army strongly disagrees with the recommendations for correction action.</u> Delete both paragraphs and replace with "Based on the input from the Army, results of the previously conducted Federal Advisory Commission, and the on-going negotiations between the Services through the JDL Advanced Materials Technical Panel, we conclude that it is in the best inter-

esis of the Army and DoD for the construction of the proposed Army Materials Research Facility at Aberdeen Proving Ground, MD, to continue as per BRAC 91. No corrective action is required."

Rationale-- Recommend deleting both as unsubstantiated and unnecessary in the context of the Army arguments presented in this rebuttal document. Results of the ongoing Tri-Service negotiations on Materials is at TAB D.

Appendix A - Army Research Laboratory Military Construction Project (p. 17)

-- *Army Comment* -- Nonconcur. Figures are not up to date. Note that the estimated cost for the installed equipment has been reduced from $28,390,00 to $21,200,000 as a result of the Tri-Service negotiations documented at TAB E.

Rationale-- Reviews of the equipment associated with this project have resulted in this new revised estimate. Thus, the Project total changes from $108,889,000 to $ 101,200,000, a DECREASE of $7,689,000

Appendix F - Summary of Potential Benefits (p. 25)

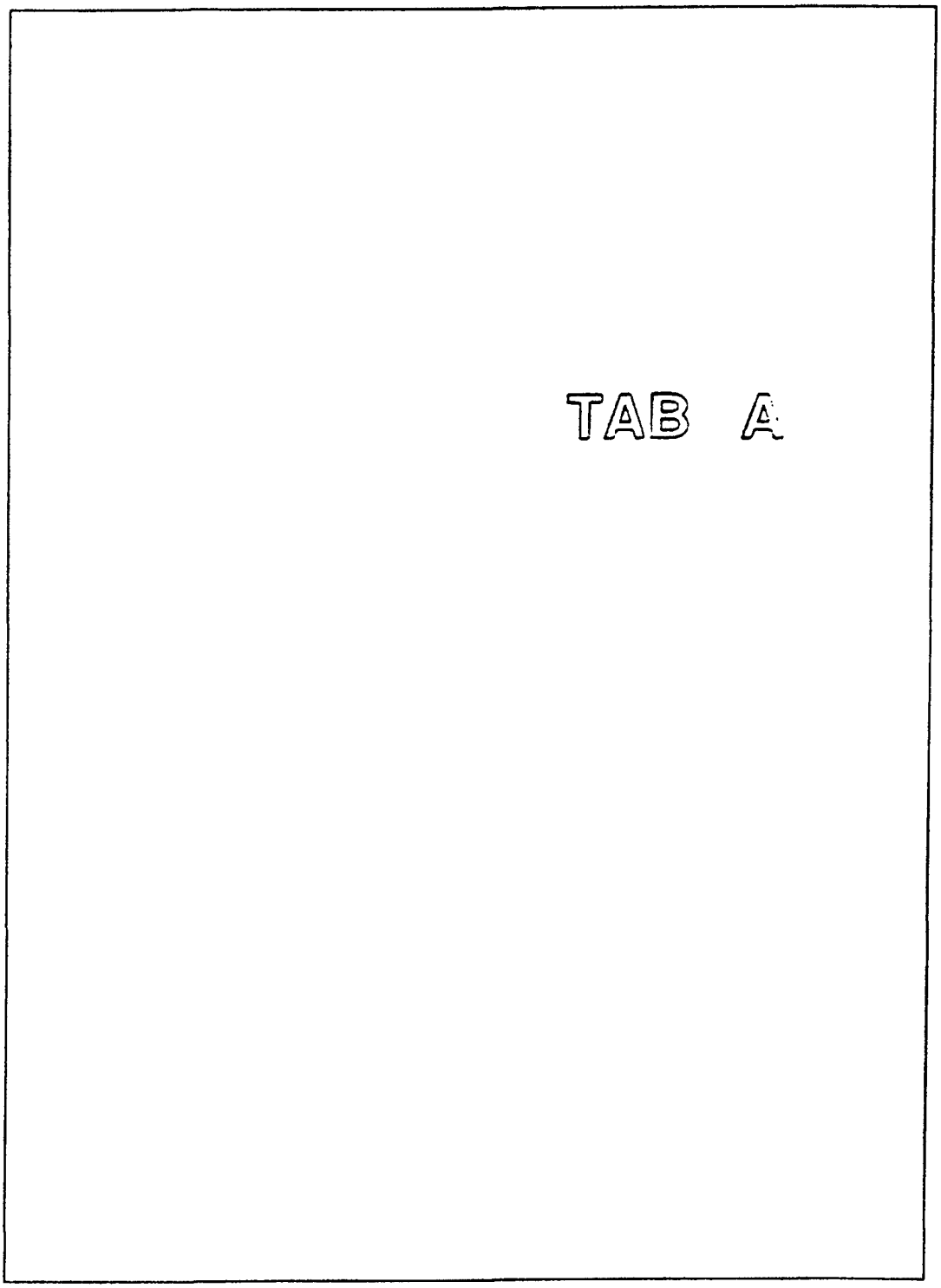
- *Army Comment*- Nonconcur Delete

Rationale-- Based on the Army comments above, and the conclusions of the Federal Advisory Commission, it is evident that these "potential benefits" are in direct contradiction to what leading experts have already concluded

Appendix G - Organizations Visited or Contacted (p. 26)

- *Army Comment*- Nonconcur Add under Department of the Army
  - Armaments Research, Development and Engineering Center (ARDEC), Picatinny Arsenal, NJ
  - Army Materiel Systems Analysis Agency (AMSAA), Aberdeen Proving Ground MD

Rationale -- The DoD IG visited AMSAA from 19-22 October 1993 and ARDEC from 1-4 November 1993


TAB A

AMSRL-MA-C 1 November 1993

MEMORANDUM FOR K. Christ, AMSRL-D-TO

SUBJECT: WPAFB Materials Laboratory Facilities (WL/ML)

The answer to John Bachkosky's [DDR&E] question whether WPAFB Materials Laboratory Facilities can be used by the Army instead of building a new building at APG is no. WPAFB Materials Laboratory facilities are currently utilized and fully staffed to support AF S&T materials needs. WL/ML's Technology Area Plan [Enclosure 1] gives their mission, organization, personnel strength, budget, equipment investment, and office and lab space. Although 90% of the staff are on-site contractors, the entire staff is focused on AF needs. The WPAFB Materials Laboratory Facilities have no office space available for Army personnel, and although some of their labs could be used for Army work, a significant portion of the Army lab facilities would have to be built along with all the Army office space.

Our answer is based on conversations that L. Johnson, myself, and others have had with Dr. Vince Russo and his staff during the mid August to mid October 1993 timeframe and including a phone conversation on 1 November 1993 between L. Johnson and V. Russo. It is also based on two visits. The first was made by representatives from ARL/MD, ARL/Adelphi, and the COE on 11 August 1993. They toured the physical plant, saw the equipment, and discussed budget and personnel. [Enclosure 2] The second visit was made by L. Johnson and myself on 15 September 1993. We toured both the Materials Laboratory Facilities and Building 450. This latter building was suggested as a possible alternative site for ARL by V. Russo. It was completed in 1959 and housed the AF Research Laboratory until the early 1970's. It has 118,000 GSF with only 22,620 GSF of lab space. It roughly constitutes only one third of the space needed for the Army's materials R&D program. Further it has been subsequently converted to primarily office space with some functioning lab space and is currently fully occupied with AF personnel. Building 450 is not a suitable alternative. The only conclusion we can draw from our conversations and visits is that WPAFB does not have suitable facilities to house the Army's materials R&D program.

Encl:
2 a/s

D. Vischnicki

Dennis J. Vischnicki
Chief, Ceramics & Metals Division

AMSRL-MA-CA (690c)

12 Aug 93

MEMORANDUM THRU Chief, CSB (W) 8/14/93
Chief, CD

MEMORANDUM FOR Director, Materials Directorate

SUBJECT: Trip Report for travel to Air Force Wright Laboratories, Materials Directorate, Dayton, OH, 11 August 1993. Travel Order 08-020, dated 04 August 1993.

1. PURPOSE OF VISIT: Participate in facility tours and brief program/technical descriptions to evaluate possible Air Force hosting of DoD 'purple' Laboratory: physical plant, equipment, budget & personnel.

2. SYNOPSIS OF ESSENTIAL INFORMATION:

A. Key Accomplishments: Attendees: Les Blizzard, COE-Baltimore; Pam Clark and Tom Bower, ARL-ALC. Air Force participants: John Williamson, Chief, Technical Operations; Thomas Cooper, Chief, Systems Support Div.; William Woody, Chief, S-M Mat'ls & Surv. Div.; Ted Nicolas, Metals & Ceramics Div. Brief overview of A.F. Materials Directorate, staffing, funding, research missions and vision (see Attachment) followed by tours of the laboratories. BOTTOM LINE: 1) Wright Labs-Materials Directorate is not able to physically absorb 200+ personnel and associated mission in their current facility. Office space is at premium (even with ~40 vacancies) and their is no available lab space. It seems unlikely that there is enough space at Wright Labs to upgrade to accommodate our function/mission. 2) Option to eliminate all contractors to make room for personnel for Army mission would meet significant opposition. There would be logistical problems and severe cost increases to continue the A.F. mission with GOCO type facilities. 3) As far as a DoD purple Mat'ls Lab, I don't think the A.F. would want to lose authority/responsibility over their enabling technology. They also see the development of new customer relationships with non-A.F. efforts as significant.

The Materials Directorate has excellent facilities and equipment. The bulk of their efforts are in testing, characterization and modeling of materials, not processing (contracted out). Estimates based on tour are they perform more processing than ARL-MD in metals, similar effort in polymers, similar or lower effort in ceramics and 1/2 the effort in composites. This is a rough estimation.

B. Required Actions: 1.) Les Blizzard will be in touch with Wright ——→ [illegible] Patterson civil engineers about possibility of other available space on post. 2) Find out just what are the IG recommendations. There doesn't seem to be any logic behind colocation at Wright Labs.

NCL 2

C. Recommendations:

3. REQUIRED FOLLOW-UP/MILESTONES: See 2.B.

MICHAEL J. SLAVIN
Leader, Ceramic Process & Application Team

CC:
G. Hagerman, MA
J. Rose, MA
R. Shuford, MA-PA
R. Puzzuoli, MA-DB

CEHNB-EM-C (340)

17 Aug 93
Blizzard/lb/3322

MEMORANDUM FOR Chief, Military Projects Management Branch,
ATTN: Mr. Ron Maj

SUBJECT: Army Research Laboratory, Aberdeen Proving Ground, MD

1. Reference meeting between Mr. Ron Maj, CEHNB-EM-MC and Mr. Joseph Kesler, CEHNB-EM-C, 8 Aug 93, ENB.

2. During referenced meeting, Mr. Maj requested that someone from the Cost Engineering Branch attend a meeting at Wright Patterson Air Force Base, Ohio, 10 Aug 93. Also scheduled to attend this meeting were representatives from the Materials Directorate Offices at Wright Patterson AFB, Ohio, Army Research Labs at Watertown, Massachusetts, and Adelphi, Maryland.

3. The purpose of this meeting was to discuss space availability and cost associated with the proposed relocation of the Army Research Laboratory (ARL), Materials Directorate, Watertown, MA.

NOTE: Currently the ARL has an A-E design contract (60% complete) to construct an $80,000,000 Materials Research Lab at Aberdeen Proving Ground, MD.

4. After a brief introduction session we were taken on an informational tour of the 370,000 SF complex and shown a myriad of lab modulars each housing its own scientific experiments.

5. Based on the visual inspection of the facility and verbal contact with the personnel, I believe that the current space available has already been stretched to the limit and if the two research labs where to move I feel that this would only have a draconian effect on the missions of both labs.

6. Mr. John Williamson, Materials Directorate at Wright Patterson AFB called Mr Les Blizzard, CEHNB-EM-C on 13 Aug 93 and informed Mr Blizzard that the Post does have a building (Bldg #450) with 105,000 SF which could be renovated to accommodate a portion of ARL's requirements. However, ARL requires a space of 290,000 SF to accomplish their mission. This would mean that a 185,000 SF addition would have to be affixed (or annexed) to the present facility.

CEHAS-EN-C (390)
SUBJECT: Army Research Laboratory, Aberdeen Proving Ground, MD

7. Cost for the additions and alterations to Building 3450 cannot be determined at this time without a visual inspection. Also, a member of the ARL staff should be present to point out what renovations would be necessary to bring the building up to their specifications. To answer these concerns, a Facility Engineer or equivalent should be part of the Inspection Team.

8. Point of contact for this office is Mr. Lee Blizzard, x3322.

JOSEPH KOCLER, P.E.
Chief, Cost Engineering Branch
Engineering Division

2

TAB B

ARMY LEAD/UNIQUE MATERIALS PROGRAMS

1 STRUCTURAL MATERIALS	
1 1 Metals (2ANF)	Stress corrosion & ballistic tests on Aeromet 100 for Comanche structural components. Rolling contract fatigue studies of emerging gear & bearing steels & coatings for Comanche. Al-Li alloys & low cost titanium evaluation for ground vehicle structures. The low frequency, high amplitude vibration fatigue inducing environmental unique to helicopter, i.e. Army, systems
1 2 Non-Metallic (2ANF)	Processing: Low cost fabrication of TS & TP thick composites for ground vehicles (CAV). High modulus oxynitride glass fibers for ground vehicles. Hybrid composites for artillery projectiles and rocket motor cases; automated/AI test methodology for environmental durability assessment of polymers/composites & coatings, Smart Weave (embedded sensors) to monitor/control RTM processing of thick composites for prototype hatch cover & Comanche keel beam
2 HIGH TEMPERATURE MATERIALS	
2 1 Metals & Intermetallic (2ANF)	High temperature creep & strength property evaluation of TiAl, TiAl-Nb & o-alloy including heat treatment microstructure relationships CHIP P/M fabrication oftitanium alloy for gas turbine helicopters with restricted cooling capacities (compared to AF).
2 2 Ceramics (2ANF)	Development of monolithic and self-toughening silicon nitride for turboshaft & diesel engines; monolithic and functionally gradient thermal barrier coatings; erosion resistant composite & monolithic ceramics for fins/flight surfaces for missiles & KE penetrators; evaluation of silicon nitride for ceramic & hybrid bearings; moderate to high temperature fiber development; and preceramic polymers for matrix materials & joining. Only DoD component developing monolithic ceramics.

2.3 Carbon-Carbon (2NF)	NA
3 ARMOR & ANTI-ARMOR	
3.1 Armor (3A)	Armor materials encompasses all classes of materials required for personnel & critical equipment protection in military systems including combat vehicles, aircraft, space vehicles, topside & hull protection for ships, tactical shelters and personnel armor. The Army performs all of the metallic, ceramic & composite armor materials R&D for DoD.
3.2 Anti-Armor Materials (2AN)	The Army anti-armor materials program addresses materials R&D of high density alloys for kinetic energy penetrator cores, lightweight materials for sabots, refractory metal warhead liners, and materials technology for advanced guns. The Anti-Armor Materials R&D Program is largely performed by the Army but is Reliance Cat. 2AN due to Navy effort in warhead materials.
3.3 Materials Dynamics (2AN)	Materials Dynamics encompasses R&D directed at measuring & modeling, for use in computer codes, the dynamic response, damage development & propagation and failure mechanisms of all classes of advanced materials under extreme conditions created by current and advanced threats to military systems
4 ELECTROMAGNETIC PROTECTION MATERIALS	
4.1 Ground-Based EM Protection Materials (2ANF)	Development of laser eyesystems for Army ground combat personnel.
4.2 Space-Based Hardened Materials (4F)	NA
5 ELECTRONIC, MAGNETIC & OPTICAL MATERIALS	
5.1 Semiconductor Materials (2ANF)	NA

5.2 Non-Linear Optical Materials (3F)	NA
5.3 Superconductor Materials (2NF)	NA
5.4 Electromagnetic Transparent Materials (2ANF)	IR and radar transparent window materials for advanced Army air defence missile applications The weight and robustness requirements of shoulder-launched Army systems, which need dust- and rain-erosion protection, require lighter, tougher materials.
5.5 Magnetic, Piezoelectric & Magneto-Strictive Mat'ls (3N)	NA
5.6 Electro-Ceramic Materials (3A)	Development of tunable, high-dielectric constant ceramic materials for Army phased-array radar to enhance deployment through lightweight systems
6 SPECIAL FUNCTION MATERIALS	
6.1 Fire Retardant Materials (3N)	NA
6.2 Paints Coatings & Cleaning Materials (2ANF)	Develop & evaluate low VOC, high-temperature, heat resistant paint and chemical agent resistant coatings (CARC) for Army tactical ground & air vehicles and facilities
6.3 Fluids & Lubricants (2ANF)	Improved non-flammable hydraulic fluid; improved engine coolant, transmission fluid, & silicone brake fluid; fluid reclamation; solid film lubricant for troop automatic weapons; greases for aircraft & ground equipment.
6.4 Elastomers & Seals (2ANF)	Formulate, development and evaluate improved elastomers for trackpads, bushings, and road-wheels for armored combat vehicles (Army unique).

5 Chemical & Bio-Protection Materials (3A)	Model CW permeation through polymers & elastomers; develop advanced CARC paints for ammunition, aircraft and ground vehicles; processing of chemical resistant polyurethane elastomers. Army lead in this area due to greater likelihood of ground troop exposure.
6 6 Thermal Management (2NF)	NA
7 BIO-MOLECULAR MATERIALS & PROCESSES	Army experience in biotechnology, developed through extensive work in food, textiles and CBW and use & exploitation of biologic processes has resulted in unique expertise.
7 1 High Temperature Materials (2ANF)	Develop biomimetic processes for producing ceramic powders and tapes.
7 2 Armor & Anti-Armor (2ANF)	Characterize & learn to fabricate proteins leading to silk-like fibers for composites & textiles
7 3 Electromagnetic Shielding (2ANF)	Develop biocatalytic approach to synthesis of conjugated polymers for electrical & optical applications
7 4 Electrical, Magnetic & Optical Matls (2ANF)	Develop biomaterials for signature reduction; develop biomimetic route to ceramics for phased array antennas & phase shifters
7 5 Special Function Materials ((2ANF)	Characterize, clone & produce membrane receptors for incorporation into biosensors & Navy applications Develop new elastomers & membranes, enzymes for reactive materials and finishes (decontamination).
7 6 Materials Processing, Manufacturing (2ANF)	Mimic biologic processes to produce ceramics & polymers in an environmentally benign manner; develop micro-organisms or their products for environmental remediation applications; beneficiate & optimize products from renewable resources (e.g. toughened wood).
7 7 New Material Concepts (2ANF)	NA

MATERIALS PROCESSING/MANUFACTURING RESEARCH

1 Process Modeling & Control (2ANF)	Development of intelligent expert systems for automated testing methodologies for environmental durability & life cycle assessment of ground and helicopter materials due to unique Army field environment.
2 Forming & Net Shape Processing (2ANF)	NA
3 Joining (2ANF)	Army has major Center of Excellence in Adhesive Science; development of adhesive interphase structure & bonding methods for OMC's & MMC's for lightweight combat materiel prototypes Develop welding of higher hardness steels and aluminum alloys for armor.

NON-DESTRUCTIVE INSPECTION/ EVALUATION (NDI/E) TECHNOLOGY

9 1 Advanced Materials & Process Development NDE (2ANF	Development of field portable ultrasonic system for thick section composites to measure ballistic damage & degradation of structural integrity, develop sensory grid to control the resin flow/wet out during RTM of thick composites (for CAV & Comanche)
9 2 Manufacturing NDI/E (2ANF)	Application of neural networks & image analysis to automated inspection of munition fuzes, develop laser based non-contact electrical test for IC's & printed circuit boards
9 3 In-Service Performance (2ANF)	Develop intelligent neural networks for testing applications e.g. shock absorber; investigate embedded sensors to measure & evaluate the presence and extent of damage in composite materials for unique Army field environment

10 MATERIALS TRANSITION TECHNOLOGY DEMONSTRATION

10 1 Advanced Mat'ls & Mfg Technology (ADT/ATTDS) (2ANF)	Material intensive AATDs are the Composite Armor Vehicle (CAV) & the Soldier Integrated Protective Ensemble (SIPE). The CAV includes

material demonstration, design integration manufacturing technology for advanced ground combat vehicles. SIPE includes advanced concepts in materials for ballistic & laser eye protection for ground troops. BMDO demonstrations include advanced lightweight & highly damped structural materials applications, advanced optical materials for baffles & guidance windows, and advanced net-shape low-cost manufacturing technology for low production run components.

1: SIGNATURE CONTROL MATERIALS

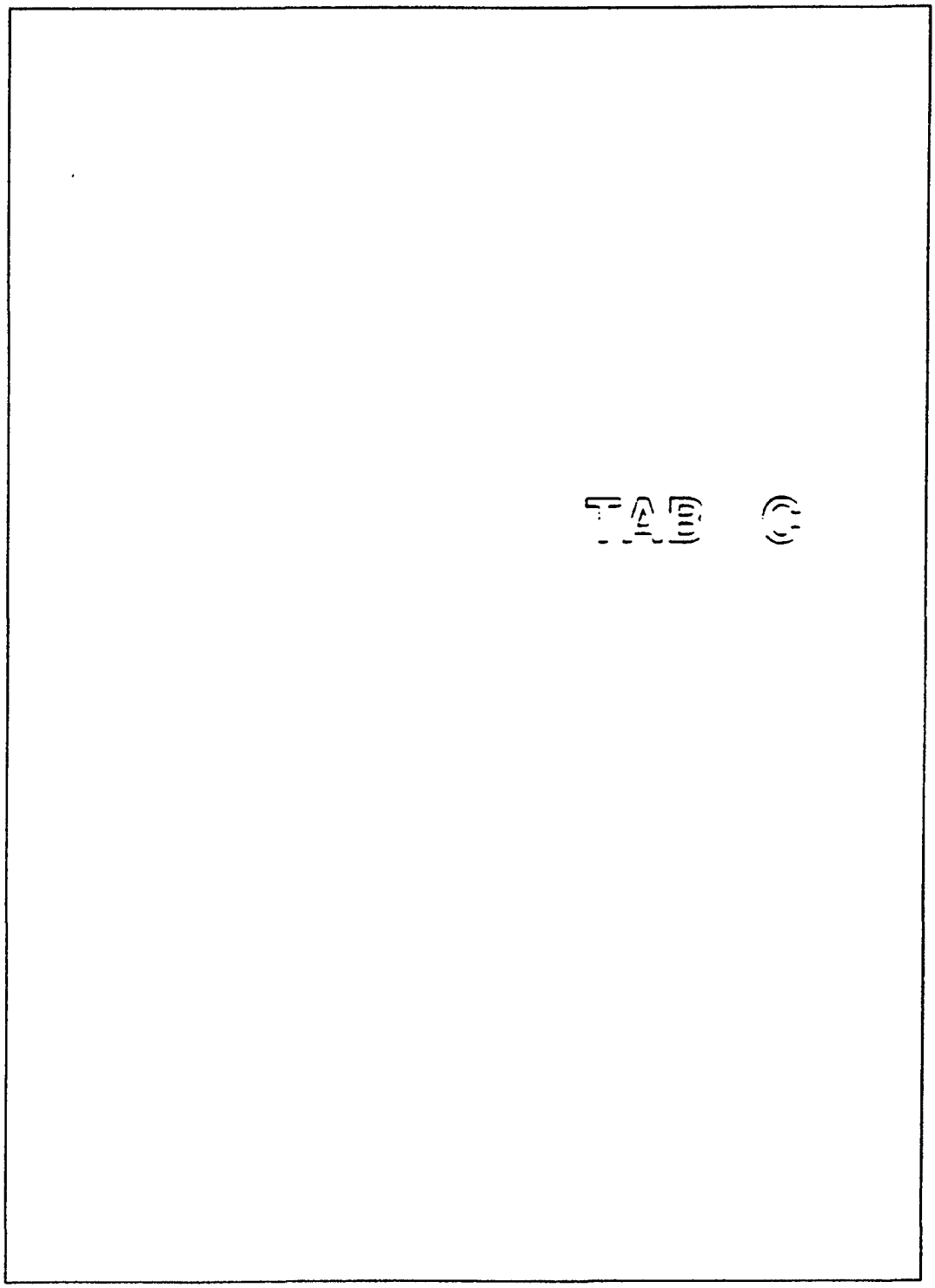
1: 1 Radar Materials (2ANF) — Classified Programs

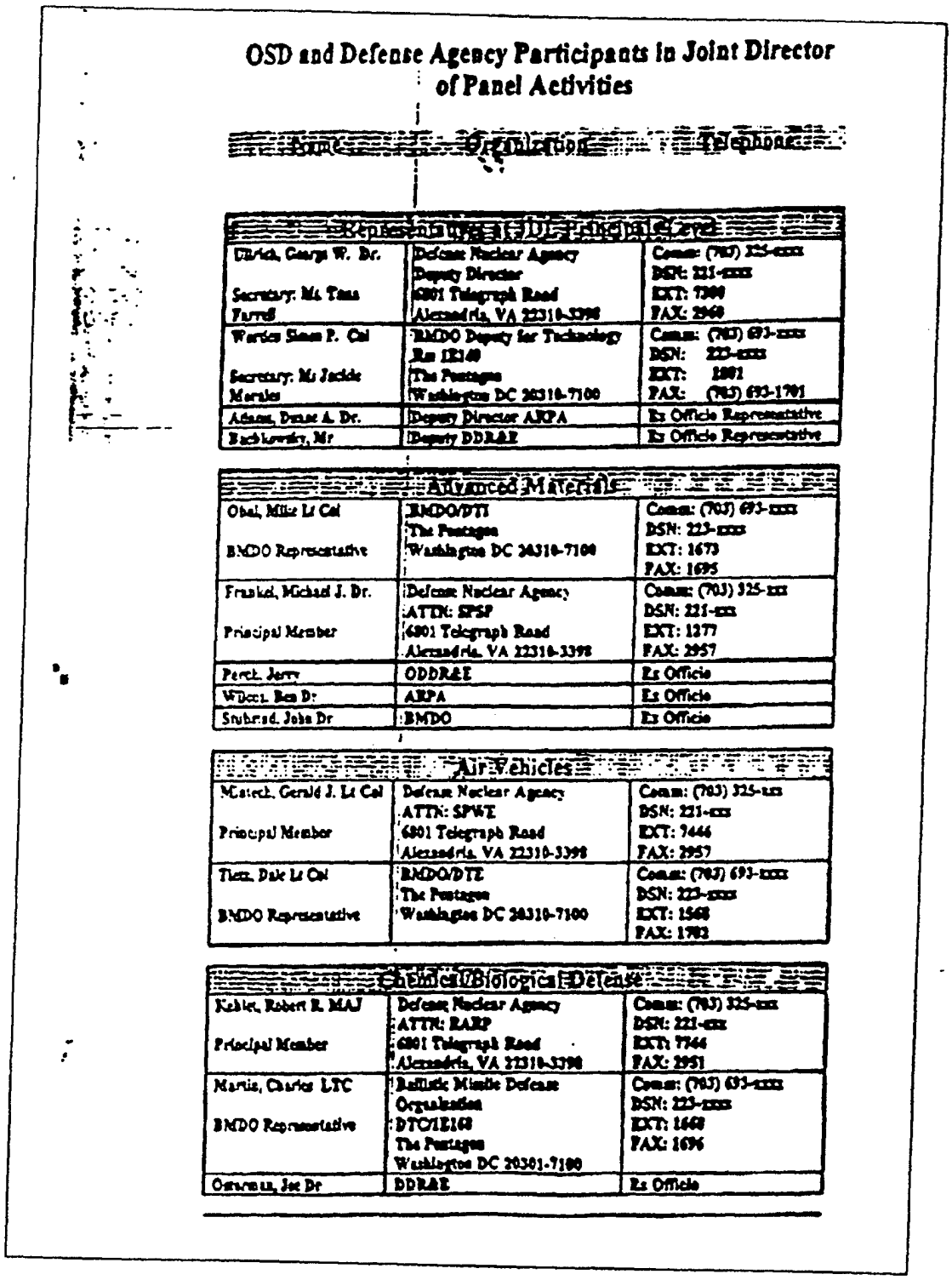
1: 2 Optical Materials (2ANF)

1: 3 Smoke Obscurants (2ANF)

1: 4 NDE Inspection (2ANF)

Appendix F. Army Point-By-Point Comments





OSD and Defense Agency Participants in Joint Director of Panel Activities

Name	Organization	Telephone
Representatives at DUSD Principal Level		
Ulrich, George W. Dr. Secretary: Ms Tina Farrell	Defense Nuclear Agency Deputy Director 6801 Telegraph Road Alexandria, VA 22310-3398	Comm: (703) 325-xxxx DSN: 221-xxxx EXT: 7300 FAX: 2960
Worden Simon P. Col Secretary: Ms Jackie Morales	BMDO Deputy for Technology Rm 1E148 The Pentagon Washington DC 20310-7100	Comm: (703) 693-xxxx DSN: 223-xxxx EXT: 1801 FAX: (703) 693-1701
Adams, Denise A. Dr.	Deputy Director ARPA	Ex Officio Representative
Bachkowsky, Mr	Deputy DDR&E	Ex Officio Representative
Advanced Materials		
Obal, Mike Lt Col BMDO Representative	BMDO/DTI The Pentagon Washington DC 20310-7100	Comm: (703) 693-xxxx DSN: 223-xxxx EXT: 1673 FAX: 1695
Frankel, Michael J. Dr. Principal Member	Defense Nuclear Agency ATTN: SPSP 6801 Telegraph Road Alexandria, VA 22310-3398	Comm: (703) 325-xxx DSN: 221-xxx EXT: 1277 FAX: 2957
Percl, Jerry	ODDR&E	Ex Officio
Wilcox, Ben Dr	ARPA	Ex Officio
Stubstad, John Dr	BMDO	Ex Officio
Air Vehicles		
Mastech, Gerald J. Lt Col Principal Member	Defense Nuclear Agency ATTN: SPWE 6801 Telegraph Road Alexandria, VA 22310-3398	Comm: (703) 325-xxx DSN: 221-xxx EXT: 7446 FAX: 2957
Tiene, Dale Lt Col BMDO Representative	BMDO/DTE The Pentagon Washington DC 20310-7100	Comm: (703) 693-xxxx DSN: 223-xxxx EXT: 1568 FAX: 1702
Chemical/Biological Defense		
Kahler, Robert R. MAJ Principal Member	Defense Nuclear Agency ATTN: RARP 6801 Telegraph Road Alexandria, VA 22310-3398	Comm: (703) 325-xxx DSN: 221-xxx EXT: 7744 FAX: 2951
Martin, Charles LTC BMDO Representative	Ballistic Missile Defense Organization DTO/IE148 The Pentagon Washington DC 20301-7100	Comm: (703) 693-xxxx DSN: 223-xxxx EXT: 1668 FAX: 1696
Osmeyer, Joe Dr	DDR&E	Ex Officio

OSD and Defense Agency Participants in Joint Director of Panel Activities

Name	Organization	Telephone
Command, Control & Communications		
Kenyon, Al CDR BMDO Representative	BMDO/DTC The Pentagon Washington DC 20310-7100	Comm: (703) 695-xxxx DSN: 225-xxxx EXT: 8843 FAX: (703) 693-1696
Witwer, Lana A. Dr. Principal Member	Defense Nuclear Agency ATTN: RAAE 6801 Telegraph Road Alexandria, VA 22310-3398	Comm: (703) 325-xxx DSN: 221-xxxx EXT: 7028 FAX: 6289
Jones, Bud Col	JCS-J-6	Ex Officio
Computer Sciences		
Hong Fong, Kenneth Mr. DNA Representative	Defense Nuclear Agency ATTN: DRMO 6801 Telegraph Road Alexandria, VA 22310-3398	Comm: (703) 325-xxxx DSN: 221-xxxx EXT: 0472 FAX: 1325
Lane, Louis Mr. BMDO Representative	BMDO/DTI The Pentagon Washington DC 20310-7100	Comm: (703) 693-xxxx DSN: 223-xxxx EXT: 1673 FAX: 1695
Bre... Joe Dr	ODDR&E	Ex Officio
Castor, Virginia	ODDR&E	Ex Officio
Thompson, Ed	ARPA	Ex Officio
Ewing, PhD	DMA	Ex Officio
Hill, Richard	BMDO	Ex Officio
Conventional Air/Surface Weaponry		
Dyer, Walter Dr. BMDO Representative	Ballistic Missile Defense Organization DTC/IE168 The Pentagon Washington DC 20301-7100	Comm: (703) 695-xxxx DSN: 225-xxxx EXT: 8846 FAX: (703) 693-1696
Lewis, David R. Mr. Principal Member	Defense Nuclear Agency ATTN: OTA 6801 Telegraph Road Alexandria, VA 22310-3398	Comm: (703) 325-xxx DSN: 221-xxx EXT: 1215 FAX: 2684
Shore, Michael J. Dr. DNA Representative	Defense Nuclear Agency ATTN: OTA 6801 Telegraph Road Alexandria, VA 22310-3398	Comm: (703) 325-xxxx DSN: 221-xxxx EXT: 1215 FAX: 2684
McFarland, Clifford Dr	DNA	Ex Officio
Mees, Rick Mr	ODDR&E	Ex Officio
Kopenak, George Mr	OASD(A) TAC Systems Director of Munitions	Ex Officio
Hichlack, Tom Mr	OASD(A) TAC Systems Director of Munitions	Ex Officio

OSD and Defense Agency Participants in Joint Director of Panel Activities

Name	Organization	Telephone
Directed Energy		
Grill, Neil Mr. BMDO Representative	BMDO/DTD The Pentagon Washington DC 20310-7100	Comm: (703) 693-xxxx DSN: 223-xxxx EXT: 1508 FAX: 1702
Frankel, Michael J. Dr. Principal Member	Defense Nuclear Agency ATTN: SPSP 6801 Telegraph Road Alexandria, VA 22310-3398	Comm: (703) 325-xxx DSN: 221-xxx EXT: 1277 FAX: 2957
Gosterak, Stan	ODDR&E	Ex Officio
Baker, George	DNA	Ex Officio
Lynch, Myrne LtCol	DNA	Ex Officio
Jones, Cecil Lt Col	JCS-J-33	Ex Officio
Powell, James Cmdr	JCS-J-33	Ex Officio
Buchanan, Lee	ARPA	Ex Officio
Gadd, Thomas	DIA	Ex Officio
Caldwell, Tom	FSTC	Ex Officio
Raines, Randy	FSTC	Ex Officio
Petty, James Maj	HQ DOE	Ex Officio
Hoeberling, Robert	Los Alamos	Ex Officio
George, Victor	Lawrence Livermore	Ex Officio
Prestwitch, Ken	Sandia	Ex Officio
Electronic Devices		
Pulkari, Leslie J. Dr. Principal Member	Defense Nuclear Agency ATTN: RAEE 6801 Telegraph Road Alexandria, VA 22310-3398	Comm: (703) 325-xxx DSN: 221-xxx EXT: 1159 FAX: 0289
Wu, Kepi Dr. BMDO Representative	BMDO/DTI The Pentagon Washington DC 20310-7100	Comm: (703) 693-xxxx DSN: 223-xxxx EXT: 1673 FAX: 1695
MacCallum, John	ODDR&E	Ex Officio
Electronic Warfare		
Baker, George H. Dr. Principal Member	Defense Nuclear Agency ATTN: RAEE 6801 Telegraph Road Alexandria, VA 22310-3398	Comm: (703) 325-xxx DSN: 221-xxx EXT: 1145 FAX: 0289
Gosterak, Stan	ODDR&E	Ex Officio
Bal, Bart	ARPA	Ex Officio
Hoalda, David	NSA	Ex Officio
Leam, W. Andrew	JEWC	Ex Officio
Stone, Earnest	JEWC	Ex Officio
Sweet, Dana	DIA	Ex Officio
Wineberg, Phil	JCTC-AS1	Ex Officio

OSD and Defense Agency Participants in Joint Director of Panel Activities

Name	Organization	Telephone
Environmental Science		
Galloway, Charles R. Dr. Principal Member	Defense Nuclear Agency ATTN: SPWE 6801 Telegraph Road Alexandria, VA 22310-3398	Comm: (703) 325-xxx DSN: 221-xxx EXT: 1282 FAX: 2957
McMurrow, Dan Col BMDO Representative	BMDO/DTS The Pentagon Washington DC 20310-7100	Comm: (703) 695-xxxx DSN: 225-xxxx EXT: 8836 FAX: (703) 693-1696
Smith, Capt	ODDR&E	Ex Officio
Management & Basic Research		
Dunton, Dwight Dr. Principal Member	BMDO DTD/12167 The Pentagon Washington, DC 20310-7100	Comm: (703) 693-xxxx DSN: 223-xxxx EXT: 1671 FAX: 1695
Gerding, James M. Mr. Principal Member	Defense Nuclear Agency ATTN: OTA 6801 Telegraph Road Alexandria, VA 22310-3398	Comm: (703) 325-xxx DSN: 221-xxx EXT: 1217 FAX: 2684
Sensors		
Frederick, Bill Dr. BMDO Representative	BMDO/DTS The Pentagon Washington DC 20310-7100	Comm: (703) 695-xxxx DSN: 225-xxxx EXT: 8832 FAX: (703) 693-1696
Ulrich, G Wayne Dr. Principal Member	Defense Nuclear Agency ATTN: RAAE 6801 Telegraph Road Alexandria, VA 22310-3398	Comm: (703) 325-xxx DSN: 221-xxx EXT: 7031 FAX: 0289
MacCallum, John	ODDR&E	Ex Officio
Space Vehicles		
Beaty, Charles W. MAJ Principal Member	Defense Nuclear Agency ATTN: RAEV 6801 Telegraph Road Alexandria, VA 22310-3398	Comm: (703) 325-xxx DSN: 221-xxx EXT: 1120 FAX: 0289
Yeakel, Glenn Maj BMDO Representative	BMDO/DTS The Pentagon Washington DC 20310-7100	Comm: (703) 695-xxxx DSN: 225-xxxx EXT: 8841 FAX: (703) 693-1696

TAB D

ADVANCED MATERIALS TRI-SERVICE NEGOTIATIONS

The mission of the ARL Materials Directorate is becoming more focused on unique Army requirements, with other mission areas being eliminated or transferred to another service under Reliance (see Table 1 below). Equipment requirements are continuously being reviewed such that only that equipment necessary to meet the future mission needs is either moved to APG or procured. Initial agreements already have been reached with the Navy to increase our reliance on each other for certain equipment needs (see Table 2 below). We continue to pursue with the Navy and the Air Force other missions and equipment that can be jointly shared under Reliance.

The Army and Navy recently completed a study of the proposed ARL Materials Facility at APG and the Navy's proposed Materials Facility at Cardarock. The Army Corps of Engineers and Navy Facilities Engineers evaluated in detail the ARL-MD APG building design and cost estimates. It was found that the cost differentials and space allotments are all rational and within expected ranges. It was also noted that the missions of the two facilities are completely different, with the ARL Materials mission being a tech base effort and the NSWC Cardarock mission being applied and engineering in nature. At the request of the Tri-Service S&T executives, Dr. Blatstein, NSWC Technical Director, and Dr. Lyons, ARL Director, confirmed that the Carderock/APG study was accurate and complete.

TABLE 1
CHANGES IN ARMY MATERIALS MISSION/FACILITIES

1988 Watertown/Ft. Belvoir	1995
Polymer Materials Research	APG
Polymer/Composites Processing	APG
Fire-Resistant Materials Research	Reliance Transfer to NSWC & NRL in 199
Ceramics Materials Research	APG
Ceramic Materials Processing	APG
Metallic Materials Research	APG
Metals Processing	APG
High Load Thermal Mechanical Metal Forming	Reliance Transfer to AF in 1995
DU Processing Facility	BRAC loss in 1991
Electroplating Facility	BRAC loss in 1991
Beryllium Laboratory	BRAC loss in 1991
Welding Research	Reliance Transfer to NSWC in 1996
Machine Shop	BRAC loss (rely on ARL/APG)
Mechanics Research	APG
Structures Analysis/Testing	BRAC Transfer to VSD/ARL in 1993
Structures NDE Research	BRAC Transfer to VSD/ARL in 1993
Mechanical Properties	APG
High Load Mechanics Testing	Reliance Transfer to NSWC in 1996
International Charpy Calibration Program	Reliance Transfer to NIST
Dynamic Properties Research	APG
Ballistic Test Ranges	BRAC loss (rely on ARL/APG)
Detonics Facility	BRAC loss (rely on APG)
Environmental Durability	APG
Hot Corrosion Testing	Reliance Transfer to NSWC in 1996
Corrosion Center of Excellence	Phase-out
GA Life Prediction	APG
NDE School	Phase-Out
Surface Processing Analysis	APG
Microstructure Analysis	APG
Chemical Analysis	APG

TAB E

TABLE 2
REDUCED EQUIPMENT PROCUREMENT

FACILITY EQUIPMENT	MD-ARL	DOD/RELIANCE
Fire-Resistant Materials Research		
Cone Calorimeter	$150K	Navy
Oxygen Index Apparatus	$ 25K	Navy
Thermal Diagnostic System	$150K	Navy
Smoke Chambers	$ 80K	Navy
Self Ignition Apparatus	$ 15K	Navy
Flame Test Chamber	$ 15K	Navy
High Temperature Oxygen Index System		$300K/Navy
High Load Thermal Mechanical Forming		
Instrumented 800 Ton Press	$500K	Air Force
Instrumented 12 inch Rolling Mill		$400K/MD-ARL
Welding Research		
Laser Vision Systems	$200K	Navy
Diffusible Hydrogen Analyzer	$ 30K	Navy
High Load Mechanical Test Equipment		$400K/NSWC
1000 kip Servo-Hydraulic Test Frame		
Free Standing Structural Actuators		
High Speed Actuator		
Hot Corrosion Testing		
Dynamic Hot Corrosion Rig	$ 60K	Navy
Ballistic Test Range Facilities		
Guns & Instrumentation		$600K/WTD-ARL
TOTAL SAVINGS	$1,205K	$1,700K

Appendix A Army Research Laboratory
Military Construction Project

Project No. 4180*
Aberdeen Proving Ground, Maryland
Materials Directorate Laboratory

Proposed Area	Square Feet	Proposed Cost
PRIMARY FACILITY		$67,163
Laboratory	172,132	(43,493)
Laboratory Offices	40,176	(4,823)
Administrative Offices	4,775	(408)
Special Use Areas	8,100	(1,092)
Mechanical/Electrical Space	57,224	(14,788)
HAZMAT [1] Storage Facility	3,807	(942)
HAZMAT Waste Storage Facility	1,410	(207)
IDS [2] Installation		(88)
Industrial Wastewater Treatment Facility	2,000	(425)
Building Information Systems		(897)
SUPPORTING FACILITIES		5,163
Electric Service	148,000	(981)
Water, Sewer and Gas	13,340	(610)
Paving, Walks, Curbs and Gutters	5,460	(830)
Storm Drainage	LS	(696)
Site Improvements	LS	(1,903)
Information Systems	LS	(88)
Traffic Control and Lights		(45)
ESTIMATED CONTRACT COST		72,326
CONTINGENCY PERCENT (5.00%)	0.05	3,616
SUBTOTAL		75,942
SUPERVISION, INSPECTION & OVERHEAD (6.00%)	0.06	4,557
TOTAL REQUEST		80,499
TOTAL REQUEST (ROUNDED)		80,000
REPLACEMENT EQUIPMENT-BCA 50		22,900
PROJECT TOTAL		$102,900

[1] Hazardous Material
[2] Intrusion Detection System

Appendix G. Audit Point-By-Point Response

The Department of the Army strongly disagreed with the statements made in the Executive Summary. The Army stated that the Army Research Laboratory (ARL) was officially formed in October 1992 after years of study of the Department of Defense (DoD) and the Department of the Army's (DA) research and development community by both internal and external groups. The most recent studies, LAB 21, the 1991 Base Realignment and Closure Commission, and the Federal Advisory Commission on Consolidation and Conversion of Defense Research and Development Laboratories, each specifically endorsed the concept of a consolidated, multi-disciplinary, "world class" Army Research Laboratory.

The ARL is the corporate laboratory for the Army, providing a research capability to enable the Army to meet the warfighting challenges of the future battlefield. Such a corporate laboratory must have a strong in-house research capability with a critical mass of work in key technology areas. Electronics and materials are fundamental technologies and constitute core competencies for the laboratory. State-of-the-art research facilities and equipment must be made available to attract and retain a highly competent and dedicated workforce. The Army is committed to the planned investment in ARL.

Audit Response. While Army strongly disagrees with the statements made in the Executive Summary, the Army never specifically states what it is the Army disagrees with. The Army does, however, state that "the Army Research Laboratory (ARL) was officially formed in October 1992 after years of study of the Department of Defense (DoD) and the Department of the Army's (DA) research and development community by both internal and external groups. The most recent studies (include), LAB 21, the 1991 Base Realignment and Closure Commission, and the Federal Advisory Commission on Consolidation and Conversion of Defense Research and Development Laboratories."

On October 7, 1993, representatives of the IG, DoD, met with the Deputy Under Secretary of the Army (Operations Research) and the Deputy Assistant Secretary of the Army for Research and Technology to discuss questions that had arisen during the audit. In advance of this meeting, we provided a detailed list of written questions to be discussed. In a written response to these questions provided during the meeting, the Army specifically wrote that, "The draft LAB 21 report is the `only' study that is the foundation for the establishment of the `flagship' Army Research Laboratory." The Army further wrote that the LAB 21 "report itself was not finalized, however, the main concept of establishing a corporate flagship research laboratory carried on up to and including inclusion in BRAC 91."

The Department of the Army nonconcurred with the following statement on page 2, paragraph 4, sentence 1 of the draft report. "Because of the condition of its facilities and infrastructure, the 1988 Base Realignment and Closure (BRAC) Commission recommended that the Army Materials Technology Laboratory in Watertown, Massachusetts, be permanently closed." The Army also nonconcurred with the statement on page 2, paragraph 4, sentence 2 that

states; "A major consideration for this conclusion was the need for major renovation or replacement of laboratory facilities." Additionally, the Army nonconcurred with the following statement on page 2, paragraph 4, sentence 3, which states; "To avoid the cost of construction, the 1988 BRAC Commission recommended relocating the laboratory."

Audit Response. On page 60 of the "Base Realignments And Closures, Report of the Defense Secretary's Commission," December 1988, the 1988 BRAC Commission stated the following regarding the Army Material Technology Laboratory (AMTL), Massachusetts: "The Commission recommends Army Material Technology Laboratory (AMTL) for closure primarily due to the condition of its facilities and infrastructure. The laboratory's mission of developing new materials to enhance the effectiveness and warfighting capability of the Army can be performed at other Army installations. Relocating that mission will take advantage of existing Army property, reduce base operations costs, and combine research groups with those working on similar technologies. The net cost of closure will be paid back within one year. The Commission expects annual savings to be $7.1 million." The 1988 BRAC Commission report continues on page 60; "AMTL facilities need major renovation or replacement, the laboratory can be relocated and the construction avoided."

The 1988 BRAC Commission statements are rather straightforward and not subject to misinterpretation. Accordingly, we stand by the statements made in our draft Quick-Reaction Report.

The Department of the Army nonconcurred with the first sentence on page 2, paragraph 5, of the draft report. "Based upon an appeal by the Army, the 1991 BRAC Commission subsequently modified the 1988 BRAC Commission recommendations and realigned the Materials Technology Laboratory to Aberdeen Proving Ground, Maryland, and approved establishment of the Combat Materials Research Laboratory (subsequently renamed the Army Research Laboratory in October 1992) at Adelphi, Maryland." The Army rationale for nonconcurring is that the Army submits their BRAC recommendations to DoD, who reviews and if approved, forwards to the BRAC Commission. The Army suggested that this sentence be rephrased as follows; "The Army BRAC 91 submission forwarded by the Secretary of Defense to the 1991 BRAC Commission recommends and realigns the Materials Technology Laboratory to Aberdeen Proving Ground, Maryland, and approved establishment of the Combat Material Research Laboratory (subsequently renamed the Army Research Laboratory in October 1992) at Adelphi, Maryland."

Audit Response. Technically it is correct that the recommendations to the BRAC Commission are from the DoD and the wording on page 2 has been clarified. It is also the case, however, that for the 1993 BRAC and for all prior BRAC Commissions, each Military Department, including the Army, developed its own BRAC policy for collecting data, conducting analyses, and developing recommendations.

The report prepared by the Department of the Army related to the 1991 BRAC was entitled, "Report to the Defense Base Closure and Realignment Commission," 1 April 1991.

The Department of the Army nonconcurs with the page 3, paragraph 2, of the draft report. "The realignment of the Materials Technology Laboratory will involve relocating approximately 100 scientific and engineering employees from the existing facility at Watertown, Massachusetts, to the proposed new laboratory at Aberdeen Proving Ground, Maryland. The new advanced materials laboratory plans to employ a total of 221 persons, of which 178 would be scientists and engineers." The Army believes we should state that the number of personnel being relocated from Watertown, Massachusetts should be stated as 181 personnel. The Army also believes that we should state that 40 personnel will be relocated from Ft. Belvoir, Virginia to Aberdeen Proving Ground, Maryland. The Army also states that of the 221 personnel that would be employed at the Advanced Materials Laboratory at Aberdeen Proving Ground, Maryland, 189 would be scientists and engineers.

Audit Response. While visiting the existing facility at Watertown, Massachusetts, we were told by Laboratory management that the number of personnel that would "probably" relocate to Aberdeen Proving Ground, Maryland to be approximately 100 individuals. The number of personnel referenced by the Army above would be correct only if every person at Watertown, Massachusetts that the Army wants to relocate will actually do so. Nevertheless since the Army believes that 181 personnel will relocate to Aberdeen Proving Ground, we modified our report accordingly. In addition, since the Army now states that they will have 189 scientists and engineers at Aberdeen Proving Ground, we adjusted our final report accordingly.

We believe the Army erred regarding the 40 personnel the Army claims will be relocated from Ft. Belvoir, Virginia to Aberdeen Proving Ground, Maryland. Specifically, on page B-38 of the Army Research Laboratory Implementation Plan, July 15, 1992, the Army indicates that 24 personnel from the Belvoir Research Development and Engineering Center, Fort Belvoir, Virginia will be relocated to Aberdeen Proving Ground, Maryland. On page B-42 of this same implementation plan, the Army indicates that the 40 personnel referred to above, will be relocated from the Night Vision and Electro-Optical Devices Laboratory at Fort Belvoir, to the Army Research Laboratory at Adelphi, Maryland. Accordingly, we believe our statement regarding personnel transfers to Aberdeen Proving Ground, Maryland, is reasonable and correct.

The Department of the Army also nonconcurs with the last sentence of paragraph 3, page 3, of the draft report. "Total implementation cost for the Army Research Laboratory including new laboratory construction and personnel-related costs were estimated to be $415 million in the Army's FY 1994 `Justification Submitted to Congress,' March 1993." The Army believes that the FY 95 BRAC 91 Budget Submission to Congress that shows total implementation cost to be approximately $365 million should be used instead.

Audit Response. We noted that while the Army nonconcurs, the Army did not dispute the fact that in the Army's FY 1994 "Justification Submitted to Congress," March 1993, the total estimated cost for implementation was given at $415 million. We also note that the Army fails to mention why their FY 95 BRAC 91 Budget request to Congress was reduced by $50 million ($415 million vs. $365 million). Specifically, it was pointed out to the Army during the course of our audit that the proposed microelectronics laboratory at Adelphi, Maryland, was designed and configured as a "corporate research laboratory" not as an applications laboratory, as was claimed by the Army. In addition, we also pointed out to the Army numerous pieces of redundant equipment that the Army was planning to procure for their proposed advanced materials laboratory at Aberdeen Proving Ground, Maryland. Accordingly, since the Army has not seen fit to provide objective, detailed information to document these changes, we feel that the proper baseline to be used in this context is the $415 million total implementation cost for the Army Research Laboratory as specified in the Army's FY 1994 "Justification Submitted to Congress," March 1993."

Another source of concern regarding the Army's FY 1994 "Justification Submitted to Congress," March 1993, is the accuracy of the estimated annual cost savings of $120 million. At the time of our October 7, 1993 meeting with the Deputy Under Secretary of the Army (Operations Research) and the Deputy Assistant Secretary of the Army for Research and Technology, we requested to be advised as to the source and content of this $120 million savings figure. We made a follow-up telephone call to the designated point-of-contact and were advised that an explanatory letter was forthcoming. As of the date of this audit report, no explanatory letter has been received.

The Department of the Army nonconcurs with the Internal Controls Statement on page 5 of the draft report and requests that we delete these two paragraphs. The Army's rationale is that the report does not identify that any specific internal control weaknesses existed, nor does the report identify what questionable data was submitted to the Commission.

Audit Response. The Army submission to the DoD for the 1991 BRAC Commission on the ARL was incomplete, inaccurate, and misleading. In Part I of our report, we reported significant internal control weaknesses that contributed to this problem. We have retained that materiel, which helps illustrate why the ARL decision should be revisited.

The Department of the Army nonconcurs with the Audit Report Section concerning Prior Audits and Other Reviews on pages 5 and 6 of the draft report. Specifically, the Army wants to add a reference to the "Federal Advisory Commission on Consolidation and Conversion of Defense Research and Development Laboratories - Report to the Secretary of Defense," September 1991. The Army also desires us to quote from the findings of the Federal Advisory Commission.

In addition, the Army requested that we include in this section a "Special Report by the U.S. Army Audit Agency (AAA) - Base Realignment and Closure Construction Requirements," SR 92-702, August 12, 1992. The Army states that where ARL requirements were not supported by the Army Audit Agency, the Army research Laboratory adjusted the costs and square footage on the DD Form 1391 in accordance with the Army Audit Agency requirements.

Audit Response. We feel that the overall Department of the Army nonconcurrence as stated above is disingenuous. Specifically, we did consider the "Federal Advisory Commission on Consolidation and Conversion of Defense Research and Development Laboratories - Report to the Secretary of Defense," September 1991 and made specific reference to it in our companion Draft Quick-Reaction Report on Microelectronics (Electronic Devices) Research, Development, Test, and Evaluation Laboratories within DoD (Project No. 3AB-0058.02). Contrary to Army claims, the Federal Advisory Commission on Consolidation and Conversion of Defense Research and Development Laboratories does not support construction of a new microelectronics laboratory at Adelphi, Maryland. To the extent that this report does support consolidation of Army Laboratories, it does so without having the benefit of considering the cost of implementation. In any case, since the Commission recommended that the Army delay implementation of the Electronic Devices and Technology Laboratory pending completion of a Defense Science Board Task Force on Microelectronics, and this Defense Science Board Task Force concluded that the proposed investment to build additional microelectronics research facilities is unwarranted.

We also obtained and reviewed Army Audit Agency Report No. SR 92-702, "Base Realignment and Closure Construction Requirements," August 12, 1992. The audit objective was to review the adequacy of support for construction projects related to realignments involving 8 installations from the 1991 BRAC. These installations specifically included the Adelphi Laboratory Center and Aberdeen Proving Ground, Maryland. At Aberdeen Proving Ground, Army Audit reviewed one project estimated to cost $66.4 million. Army Audit found that $54.7 million (82 percent) of the estimated costs were adequately supported, $2.9 million (4 percent) were not adequately supported, $8.8 million (13 percent) were inappropriate for base realignment funding. Army Audit also found that $20.6 million (31 percent) in costs should have been included that weren't.

We also obtained and reviewed Army Audit Agency "Review of DMRD 922 Implementation: Memorandum Report to Assistant Secretary of the Army (Financial Management)," March 30, 1992. The audit objective was to evaluate DMRD 922 savings and a baseline for measuring these savings. The audit found that the savings calculations provided by the Army for DMRD 922 were not supported. The audit also found that only a small portion of the costs associated with implementation of DMRD 922 had been reported.

The Department of the Army also nonconcurs with the second paragraph on page 8 of the draft report that reads: "In 1988, the Base Realignment and Closure Commission (BRAC) decided....."

Audit Response. The information in this paragraph was obtained from costs and square footage on the DD Form 1391 prepared by the Department of the Army in its FY 1994 "Justification Submitted to Congress," March 1993. To the degree that the proposed cost of this laboratory has been reduced by $7.8 million, we believe it has been due to the identification of redundant equipment by the audit. In any case, the Army merely makes a statement and provides no supporting documentation demonstrating even this limited cost reduction for equipment. Accordingly, we believe it is inappropriate to substitute the above data provided by the Army without subjecting it to independent audit verification.

The Department of the Army nonconcurs with page 9, paragraph 3, that reads: "The Air Force Materials Directorate at Wright Laboratory has significant underutilized facilities and equipment already in place....." The Army states that it strongly disagrees with the statements in this paragraph.

Audit Response. The Army offers as support for this nonconcurrence three brief memorandums dated from August 12 through November 1, 1993. We wish to make two observations with regard to these memorandums that support the finding, conclusions, and recommendations in our Draft Quick-Reaction Report. The first observation deals with the fact that until the IG, DoD, started making inquiries regarding possible consolidation or collocation of these materials laboratories, there was no tri-service analysis completed that ever seriously considered joint use of the facilities at Wright Laboratory. The second observation concerns the affiliations of all of the personnel writing or receiving these memorandums. Specifically, all of these personnel were affiliated with either the Army, Navy, or Air Force and had a significant vested interest in the decision.

We believe this only reinforces the need for this issue to be examined in detail by the Defense Science Board where an objective evaluation might be considered.

The Department of the Army nonconcurs with page 9, paragraph 4, which reads: "Facility and equipment requirements for research and development projects are determined by the specific types of advanced materials....." The Army states that its efforts are aimed at meeting unique Army requirements not otherwise being addressed.

Audit Response. The Army offers no information or data as evidence to refute the point we intended to make in this paragraph. Specifically, that facility and equipment requirements are determined by the type of research being conducted on advanced materials. Accordingly, we stand by the paragraph as stated.

The Department of the Army nonconcurs with page 10, paragraph 2, which reads: ".....Concerned about perceived risks associated with this approach, the Deputy Secretary of Defense selected Alternative 1 ....." Specifically, the Army believes that this paragraph did not address the positive aspects of Alternative 1 (Project Reliance) presented to the Deputy Secretary of Defense

and the Army states that total savings provided by Alternative 1 were greater than for Alternative 2 (creation of a Defense Science, Engineering and Test Agency).

Audit Response. The briefing charts we have that were presented to the Deputy Secretary of Defense on August 22, 1990 specifically detail an additional $30 million to $115 million savings that would result from reductions in the management superstructure by eliminating 1,863 positions through implementation of Alternative 2. The potential savings estimated to result from field activity restructuring and streamlining were comparable under either alternative.

In its nonconcurrence the Army requested that the last sentence in this paragraph be deleted. In the draft report this sentence read "Accordingly, upon approval of Project Reliance, a savings baseline of $1.1 billion was established for the Military Departments for the FYs 1992 through 1997 Future Years Defense Plan." The Army offered nothing in the way of evidentiary matter to support this request. Accordingly, based upon our response as indicated above, the paragraphs will remain as originally written.

The Department of the Army also nonconcurs with page 10, paragraph 3, that reads: "....The JDL seems to have used the terms "collocation" and "consolidation" solely on the basis of funding sources. Such use appears to have little to do with the physical collocation or consolidation of personnel, facilities and equipment."

Audit Response. In the Tri-Service Science & Technology Reliance Annual Report, prepared by the Joint Directors of Laboratories, December 1992, the Glossary of Terms on page F-4 defines "collocation" and "consolidation" as follows:

Collocation. This category includes programs for which in-house task execution will be collocated at a single Service's activities, with all Services retaining separate funding control. Each Service, at its option, may maintain its own in-house effort of up to 2 work-years per year, in order to ensure Service awareness of the major activity on going at the collocated site. Collocated programs may also be "joint," but there is no requirement that be the case.

Consolidation. This category includes programs that will be consolidated under a lead Service for management. For programs so designated, all related S&T funds will be transferred to the designated lead Service, and work will be carried out at that Service's activities. Based on the foregoing definitions published by Project Reliance, we stand by our statement in the draft report.

The Department of the Army nonconcurs with page 11, paragraph 1, that reads: "Neither Project Reliance nor the JDL has been analyzing or justifying the ARL or NSWC advanced materials laboratories. The Director of Defense Research and Engineering (DDR&E) has had only limited involvement with Project Reliance. The current JDL organization has resulted in "rule by committee," so that when the Military Departments representatives cannot reach agreement on a particular topic, there is no mechanism to resolve differences of

opinion." The Army states that the first sentence should be deleted and the last two sentences should be revised in accordance with the Army suggested wording.

Audit Response. In the Tri-Service Science & Technology Reliance Annual Report, prepared by the Joint Directors of Laboratories, December 1992, the Executive Summary on page vii states: "In addition to formally inviting SDIO into the Reliance joint planning process, the SAE's have also invited the Office of the Director of Defense Research & Engineering (ODDR&E), the Defense Advanced Research Projects Agency (DARPA), and the Defense Nuclear Agency (DNA) to participate."

We understand that representatives of the above named organizations participate informally in Project Reliance meetings. As such, they do not actively participate in Reliance decision-making. The Army further states that disputes are resolved in two forums: the JDL Principals Meetings and the OSD chaired Defense S&T Working Group. In fact, the Defense S&T Working Group lies outside of the Reliance process, and the Army offers nothing but a statement to support the fact that disputes are resolved in JDL Principals Meetings. The Army does not explain or demonstrate any formal process for resolving these disputes.

Based on a Department of the Air Force response to the draft audit report, we understand that certain actions are being undertaken to address this issue. Specifically, the Deputy Assistant Secretary of the Air Force (Research & Engineering) stated that; "the JDL does not have a process in place to resolve issues concerning Service investments in facilities and equipment. As a result of the DoD IG audit, the JDL principals are taking action to put procedures in place to identify and resolve facilities and equipment issues in addition to the current process to resolve program content."

The Department of the Army nonconcurs with page 11, paragraph 2, that lists realignments of the 1991 BRAC Commission related to the Army Research Laboratory and Naval Surface Warfare Center Advanced Materials Laboratories. The Army believes that, for accuracy and completeness, every realignment of the 1991 BRAC Commission related to the Army Research Laboratory should be listed.

Audit Response. Our purpose in listing only the four realignments concerned with Advanced Materials Laboratories was to keep the draft quick-reaction report as relevant and as brief as possible. That continues to be our purpose and listing every realignment of the 1991 BRAC Commission related to the Army Research Laboratory would add nothing to the content and meaning of the final report.

The Department of the Army nonconcurs with page 12, paragraph 1, that states: "BRAC process to justify building and equipping new laboratories for advanced materials research that will cost an estimated $160 million. In doing so, the Army and Navy have not considered, analyzed or justified these construction projects from a DoD perspective. As a result, new Army and Navy Research Laboratories could be built unnecessarily." The Army feels this

paragraph should be deleted because the "review process at DoD ensures that the so-called `DoD perspective' has been applied for the Service submissions prior to consolidation of all the Services inputs into the final DoD BRAC report to the commission." The Army further states that responsibility for this review can not be delegated to the Services.

Audit Response. The DoD was presented with the Military Department recommendations with approximately 2 weeks left in which to review the Army submission and consider it from a DoD perspective. As previously discussed, we believe it is significant that the actual submission prepared by the Department of the Army related to the 1991 BRAC was entitled, "Report to the Defense Base Closure and Realignment Commission," 1 April 1991. The paragraph will not be deleted as requested by the Army.

The Department of the Army also nonconcurs with page 12, paragraphs 2, 3, and 4 - "A second policy interpretation related to the need for new DoD laboratories is best summarized by ....." The Army believes that these paragraphs should be deleted and substituted with a statement written by the Army.

Audit Response. We believe our wording is factual.

The Department of the Army nonconcurs with the Recommendations for Corrective Action on pages 13 and 14. The Army's rationale is that both recommendations are unsubstantiated and unnecessary in the context of the Army arguments presented in their rebuttal document.

Audit Response. We nonconcur for all of the reasons set forth in our audit responses to the principal Army objections to the report.

Appendix H. Summary of Potential Benefits

Recommendation Reference	Description of Benefit	Amount and/or Type of Benefit
1.	Economy and Efficiency. Will ensure that funds will not be expended for unnecessary facilities and equipment.	Nonmonetary.
2.	Economy and Efficiency. Avoid the expenditure of scarce resources for new building construction and new equipment while the Air Force has underutilized laboratory space and equipment available.	Funds Put to Better Use. $160 million 1991 BRAC Military Construction and equipment procurement over the 6-year Future Years Defense Plan could be realigned. Actual net savings would depend on what alternative laboratory plan was developed.

Appendix I. Organizations Visited or Contacted

Office of the Secretary of Defense

Comptroller, Department of Defense, Arlington, VA
Director, Defense Research and Engineering, Arlington, VA
Joint Directors of Laboratories, Andrews Air Force Base, MD

Department of the Army

Deputy Assistant Secretary of the Army (Research and Technology), Washington, DC
Army Natick Research, Development and Engineering Center, Natick, MA
Army Research Laboratory, Adelphi, MD
Army Research Laboratory, Watertown, MA
Army Materiel Systems Analysis Activity, Aberdeen, MD
Armament Research Development and Engineering Center, Picatinny, NJ

Department of the Navy

Naval Air Warfare Center, Patuxent River, MD
Naval Research Laboratory, Washington, DC
Naval Surface Warfare Center, Carderock Division, Annapolis, MD

Department of the Air Force

Rome Laboratory, Griffiss Air Force Base, NY
Wright Laboratory, Wright-Patterson Air Force Base, OH

Non-Defense Federal Organizations

Congressional Research Service, Science Policy Research Division, Washington, DC

Appendix J. Report Distribution

Office of the Secretary of Defense

Under Secretary of Defense for Acquisition
Comptroller of the Department of Defense
Director of Defense Research and Engineering
Assistant Secretary of Defense (Economic Security)
Deputy Under Secretary of Defense (Logistics)
Joint Directors of Laboratories

Department of the Army

Secretary of the Army
Deputy Assistant Secretary of the Army (Research and Technology)
Auditor General, Department of the Army
Army Natick Research, Development and Engineering Center
Army Research Laboratory

Department of the Navy

Secretary of the Navy
Assistant Secretary of the Navy (Financial Management)
Comptroller of the Navy
Naval Surface Warfare Center
Naval Research Laboratory

Department of the Air Force

Secretary of the Air Force
Assistant Secretary of the Air Force (Financial Management and Comptroller)
Rome Laboratory
Wright Laboratory

Defense Agencies

Director, Defense Contract Audit Agency
Director, Defense Logistics Agency

Non-Defense Organizations

Office of Management and Budget
U.S. General Accounting Office, National Security and International Affairs Division, Technical Information Center
Congressional Research Service, Science Policy Research Division

Chairman and Ranking Minority Member of Each of the Following Congressional Committees and Subcommittees:

Senate Committee on Appropriations
Senate Subcommittee on Defense, Committee on Appropriations
Senate Committee on Armed Services
Senate Committee on Governmental Affairs
House Committee on Appropriations
House Subcommittee on Defense, Committee on Appropriations
House Committee on Armed Services
House Committee on Government Operations
House Subcommittee on Legislation and National Security, Committee on Government Operations

Senator John Glenn
Senator Howard M. Metzenbaum
Senator Barbara A. Mikulski
Senator Paul S. Sarbanes
Senator Arlen Specter
Senator Harris Wofford
Representative Helen Delich Bentley
Representative Wayne T. Gilchrest
Representative Tony P. Hall
Representative Steny H. Hoyer
Representative Marjorie Margolies-Mezvinsky
Representative Constance A. Morella

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Part IV - Management Comments

Office of the Director of Defense Research and Engineering Comments

OFFICE OF THE DIRECTOR OF
DEFENSE RESEARCH AND ENGINEERING
WASHINGTON DC 20301-3030

Dec - 1993

MEMORANDUM FOR INSPECTOR GENERAL, DEPARTMENT OF DEFENSE

SUBJECT: Draft Quick-Reaction Report on Advanced Materials Research, Development, Test and Evaluation Laboratories Within DoD (Project No.3AB-0058.01)

This responds to recommendation 1 of subject report.

While there may be advantages to collocating the Army & Navy Materials Research Laboratories at Wright Patterson Air Force Base, I am advised that the 1991 Base Realignment and Closure Commission (BRAC) realigns the Army Materials Technology Laboratory to the Aberdeen Proving Ground in Maryland and that this decision precludes consideration of other alternatives.

In view of this advice I am, unable to concur with the recommendation to initiate a Defense Science Board study of this issue.

John M. Bachkosky
Deputy Director
Defense Research and Engineering

Office of the Comptroller of the Department of Defense Comments

OFFICE OF THE COMPTROLLER OF THE DEPARTMENT OF DEFENSE

WASHINGTON DC 20301-1100

JAN 1 1994

(Management Systems)

MEMORANDUM FOR DIRECTOR, ACQUISITION MANAGEMENT DIRECTORATE
DODIG

SUBJECT: Draft Quick-Reaction Reports on Microelectronics and Advanced Materials Research, Development, Test and Evaluation Laboratories within Department of Defense

The two proposed audit reports (project numbers 3AB-0058.01 and 3AB-0058.02) contain a recommendation that the Comptroller of the Department of Defense withhold military construction funds until an independent and objective analysis has been completed as to whether the construction is still needed. The Comptroller has placed a temporary hold on FY 1994 military construction funding, pending a ruling by the Office of the General Counsel of the legal implications of doing so.

If the proposed reports are finalized and issued, I suggest that the recommendation for the Comptroller to withhold funding be made contingent upon action by the Under Secretary of Defense for Acquisition to commission an independent study. The 1995 Base Realignment and Closure (BRAC) process would provide an opportunity for study of this issue from a Department perspective. It appears that the only effective way to modify the 1991 BRAC Commission's recommendations is to propose changes to the 1995 BRAC Commission.

Alvin Tucker
Deputy Comptroller
(Management Systems)

Department of the Army Comments

DEPARTMENT OF THE ARMY
ADMINISTRATIVE ASSISTANT TO THE SECRETARY
WASHINGTON, DC 20310-0105

29 NOV 1993

SARD-ZT

MEMORANDUM FOR INSPECTOR GENERAL, DEPARTMENT OF DEFENSE (AUDITING)

SUBJECT: DoD IG Draft Quick Reaction Reports on Microelectronics (Electronic Devices) and Advanced Materials Research, Development, Test and Evaluation Laboratories Within DoD, November 13, 1993

The Army nonconcurs with the subject reports. These reports are factually inaccurate, badly flawed in logic and their conclusions are legally objectionable. Enclosed is a copy of the Army's point by point rebuttal to the subject reports that was forwarded to the Under Secretary of Defense for Acquisition on November 24, 1993 (Tab A), and subsequent legal opinion from the Army Judge Advocate General (Tab B) and Office of General Counsel (Tab C).

The Army is a leader in DoD laboratory consolidation and downsizing. The Army is investing in its future by establishing the Army Research Laboratory (ARL). After extensive study and analysis, the Army made a conscious decision in 1990 to reduce the size of its research infrastructure, increase its effectiveness, and improve quality by creating a corporate "flagship" laboratory, the Army Research Laboratory. ARL is properly balanced in its missions, functions and strategy. We have focused on those technologies most critical to future land warfare supremacy. New microelectronics and materials facilities are key to this commitment and were fully defended to, and ultimately supported by, the Deputy Secretary of Defense, Federal Advisory Commission on Consolidation and Conversion of Defense Research and Development Laboratories, 1991 Base Closure and Realignment Commission, Defense Science Board Task Force on Microelectronics and the General Accounting Office. Moreover, funding is included in the FY94 budget for this consolidation and is being offset by manpower savings. We need the Army Research Laboratory and this investment.

The subject draft audit reports are unencumbered by the facts and their conclusions are legally objectionable because they assume authority to disregard binding recommendations of the 1988 and 1991 Defense Base Closure and Realignment Commissions. These proposed draft audit reports, if finalized in their current form, will severely reduce the Army's science and technology capability and seriously impair the Secretary of Defense's legal responsibility to implement the recommendations of the Defense Base Closure and Realignment Commissions in a timely manner. We cannot turn around at this point. It is imperative that the issues and errors identified in the Army response be resolved and included in the final audit report. If resolution does not occur, the Army strongly recommends that the reports not be finalized and distributed.

George E. Dausman
Acting Assistant Secretary of the Army
(Research, Development and Acquisition)

Enclosures

CF:
USD(A)

(Audit Note: Enclosures appear at Appendix F.)

Department of the Navy Comments

DEPARTMENT OF THE NAVY
OFFICE OF THE ASSISTANT SECRETARY
(Research Development and Acquisition)
WASHINGTON D C 20350-1000

MEMORANDUM FOR ASSISTANT INSPECTOR GENERAL FOR AUDITING,
DEPARTMENT OF DEFENSE

Subj: DRAFT QUICK-REACTION REPORT ON ADVANCED MATERIALS RESEARCH, DEVELOPMENT, TEST, AND EVALUATION LABORATORIES WITHIN DOD (PROJECT NO. 3AB-0058.01)

Ref: (a) DODIG memo of 15 Nov 93

As requested by reference (a), the Department of the Navy (DON) has reviewed the subject draft report and nonconcurs with its finding and recommendations. Additional detailed comments addressing specific issues in the draft report will be forwarded under separate cover.

The Department of Defense Inspector General (DODIG) recommendation to withhold military construction funds for the new Army and Navy Advanced Materials Laboratories pending the results of a Defense Science Board (DSB) study would delay approved and fully funded Navy Base Realignment and Closure (BRAC) plans.

The tri-Service Science and Technology Executives, in conjunction with DDR&E's staff, reviewed the plans for the new Army and Navy Advanced Materials Laboratories and concluded that delaying implementation at this juncture places DOD at risk of violating final BRAC recommendations, which have the force of law.

The Navy has demonstrated a need for the planned materials facilities as part of the 91 and 93 BRAC process. Further review of all Navy RDT&E infrastructure, including materials application and research facilities, will be conducted during BRAC 95. Disruption of the Navy planned construction would seriously undermine implementation of BRAC legal requirements and overall plans to consolidate RDT&E facilities.

NORA SLATKIN

Copy to:
CNO (N091)
DDR&E
COMNAVAIR
COMNAVSEA
NAVCOMPT (NCB-53)

Department of the Air Force Comments

DEPARTMENT OF THE AIR FORCE
WASHINGTON DC

December 1, 1993

OFFICE OF THE ASSISTANT SECRETARY

MEMORANDUM FOR DOD INSPECTOR GENERAL, ACQUISITION MANAGEMENT DIRECTORATE (MR. DONALD E. REED)

SUBJECT: Draft Audit Report on Advanced Materials and Microelectronics (Projects 3AB-0058-01 and 3AB-0058-02)

The Air Force has reviewed the "Draft Quick-Reaction Reports" on microelectronics (Project No AB-0058-02) and materials (Project 3AB-0058-01). Comments on the findings in these reports are attached.

We cannot comment on legal or contractual issues regarding the proposed new facilities for the Army and Navy. However, we do agree that an independent assessment by outside technical experts, such as the DSB, would be of value in technically assessing unique aspects of laboratory facility utilization. Should an additional assessment of materials laboratories be conducted, we recommend that of a "two laboratory option" alternative also be evaluated. (1) a joint Services air and space materials and processes laboratory led by the Air Force at Wright Laboratory and (2) a joint Services land and sea materials and processes laboratory, led by the Army or Navy at a site or sites to be determined."

Apart from the Military Construction Program issues identified by the DOD IG, we believe that there is much more value to be gathered from a more vigorous application of the Tri-Service Reliance process to total program content, and also to identify and resolve major facility and equipment issues.

JAMES J. MATTICE
Deputy Assistant Secretary
(Research & Engineering)

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SUBJECT: Draft Audit Report on Advanced Materials RDT&E Laboratories Within DOD, 15 Nov 93 (Project No 3AB-0058-01)

The Air Force comments on the referenced report are as follows:

Finding - Page 9

"The Air Force Materials Directorate at Wright Laboratory has significant underutilized facilities and equipment..."

Comment: We believe the facilities and equipment at the Materials Directorate of Wright Laboratory are utilized consistent with accepted laboratory practice. The Materials Directorate employs contractor personnel on-site to support execution of the Air Force materials S&T program. These personnel could not be replaced by Army or Navy personnel without seriously impacting the Air Force materials and processes technology program. The Materials Directorate facilities and equipment would need to be substantially expanded to accommodate the materials and process technology activities of the Army and Navy

Finding - page 11

"Neither Project Reliance nor the JDL has been analyzing or justifying the ARL or NSWC advanced materials laboratories. The Director of Defense Research and Engineering (DDR&E) has had only limited involvement with Project Reliance. The current JDL organization has resulted in "rule by committee," so that when the Military Department representatives cannot reach agreement on a particular topic, there is no mechanism to resolve differences of opinion."

Comment: The JDL has a process to resolve issues concerning the content of the Service technical programs. However, the JDL does not have a process in place above the panel level to resolve issues concerning Service investments in facilities and equipment. As a result of the DOD IG audit, the JDL principals are taking action to put procedures in place to identify and resolve facilities and equipment issues in addition to the current process to resolve program content. JDL principals formally invited DDR&E to participate in Reliance in early 1993 and DDR&E has been an active participant since that time.

Audit Team Members

Donald E. Reed	Director, Acquisition Management Directorate
Raymond A. Spencer	Audit Program Director
David F. Vincent	Audit Project Manager
James F. Friel	Senior Auditor
Richard L. Collier	Auditor
Judy K. Palmer	Auditor
Tammy O'Deay	Administrative Assistant